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Delinquency and the Digital Domain: The Influence of Online Activities and Victimization Experiences on Offline Crime and Cyber Aggression among Adolescents

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Doctor of Philosophy

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By

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M.A., The New School for Social Research, 2012

Advisor: Robert Agnew, PhD

An abstract of

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Abstract

Delinquency and the Digital Domain: The Influence of Online Activities and Victimization Experiences on Offline Crime and Cyber Aggression among Adolescents

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The relationship between online activity and juvenile delinquency has been understudied, relying on basic measures of overall time spent online without examining specific online behaviors. This dissertation assesses how different online activities are associated with in-person delinquency and cyber aggression using secondary cross-sectional data from a three-state survey of 5,647 junior high and high school students entitled "Technology, Teen Dating Violence and Abuse, and Bullying in Three States." The project draws upon key criminological perspectives including strain, control, social learning, and routine activities theories, as well as polyvictimization research.

Descriptive statistics are reported for all measures. Multiple imputation is used to account for missing data on independent and dependent variables. OLS regression models are used to analyze the imputed data within the full sample, controlling for relevant demographic and psychological factors. Following the analyses of online activities and delinquency, an assessment of the influence of polyvictimization on delinquency is conducted. Finally, stratified models are assessed to examine differences in association between online activity and forms of perpetration by age, gender, and race.

Certain online activities across computers and mobile devices are associated with a higher risk of online and offline forms of delinquency. Online research is generally associated with a decrease in delinquency across devices. Victimization experiences are particularly influential for all forms of delinquency and polyvictimization is associated with increases in the risk of most forms of delinquency, even after accounting for individual victimization. With some exceptions, few demographic differences across race, age, and gender lines are found for the influence of online activity on delinquency. Limitations, policy implications, and directions for future research with an emphasis on the use of new data sources and teen dating violence are discussed.

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Delinquency and the Digital Domain: The Influence of Online Activities and Victimization Experiences on Offline Crime and Cyber Aggression among Adolescents

I. Introduction

Since the advent of the Internet in the mid-1990s, the use of online and mobile technology in everyday life has expanded dramatically. Adolescents represent a particularly avid group of consumers of new technology and researchers estimate that approximately 95% of adolescents use the Internet every day (Lenhart et al., 2011). This technological expansion provides new opportunities for education and communication among young people while encouraging unprecedented growth in the technology sector towards improving the lives of adolescents. However, the near-ubiquitous use of new, "screen-based" technologies and activity online by adolescents has raised questions about unintended social, behavioral, and health consequences.

In particular, researchers are devoting attention to how the use of computer and mobile technologies relates to antisocial behavior and delinquency, both on- and offline. A growing body of research indicates that virtual activities typically consume several hours of each day for adolescents – as much as or more than time spent with family, school, and face-to-face peer interactions combined (Lenhart et al., 2011). However, little is known about how online activity across computer and mobile devices influences perpetration of traditional or "in-person" delinquency, as well as online forms of delinquency such as cyber bullying and online dating aggression. Research has suggested that increased time online can expose individuals to strain, increase interaction with delinquent peers, provide opportunities for unstructured socialization and delinquent activities outside of parental supervision, increase exposure to violent content, and detract

from “pro-social” activities - all of which may increase the likelihood of delinquency (Hay, Meldrum and Mann, 2010; Lee et al., 2014; McCuddy and Vogel, 2015; Meldrum and Clark, 2015; Weerman, Bernasco, Bruinsma and Pauwels, 2013). This project addresses how adolescents engage in online activity throughout the day and how specific activities relate to a range of delinquent and aggressive outcomes. Second, this report examines the relationship between online and offline forms of victimization and delinquency. Finally, the project examines differences in the influence of online activity and victimization on delinquency and aggression across age, gender, and racial groups.

Contribution

Although increased attention has been paid to the relationship between online activity and delinquency, there is still much work to be done. Engagement across computer and mobile platforms is a major new area of adolescent social life that has changed the way that young people interact with the world, build relationships, develop knowledge, and conduct daily living (O’Keefe and Clarke-Pearson, 2011). Much of the research in this area relies on an incomplete theoretical approach that mainly draws upon social learning (Akers, 1985) or routine activities (Osgood, Wilson, O’Malley, Bachman, and Johnston, 1996) theories of criminal behavior while ignoring important criminological perspectives such as strain and control theories. While theories that discuss the influence of learned behavior online and greater opportunity for cyber crime through particular forms of online have much merit, it is equally important to examine the negative strains related to online activity (Agnew, 1992; 2001) as well as the role of social control in the relationship between online activity and delinquency (Gottfredson and Hirschi, 1990; Hirschi, 1969). How does online activity related to reduced social

controls, particularly if such activities are excessive and are most common in areas of school and work? How does the amount of social control by parents over online activity influence different types of delinquency? These perspectives, informed by strain and control theories, have largely been missing from the literature and are addressed here to develop a deeper theoretical understanding of cyber and offline perpetration.

Prior research has been restricted by measurements of online activity that only quantify the overall amount of time spent online. These studies tend to employ data that lack specific measurements of time spent on particular online activities like social networking, emailing, researching, texting or chatting, as well as related measures of parental restrictions for online activity. This is notable given that certain online activities may be more related to delinquency than others. For example, substantial daily time spent on certain activities like using social network applications (Facebook, Instagram, etc.), texting, or chatting may expose individuals to delinquent peers, create more opportunity for cyber crime, or increase experiences of strain. On the other hand, online activities like researching for school or spending time on user-generated content sites related to school or work may have less of an effect on delinquency. It is possible that certain activities may actually decrease the likelihood of delinquency. The extent to which parents monitor their children's activity on the computer and cellphones may also play an important role in the relationship between online activity and delinquency. Adolescents with little parental supervision of sites visited or restrictions placed on time spent online may be at greater risk for delinquency, compared to those who are more closely monitored by parents.

Where and when adolescents are spending time online may also be important for delinquency. Spending a lot of online time in one's bedroom outside of the supervision of parents may also result in greater delinquency, while online activity in a public setting with more oversight may not necessarily be related to delinquency. Similarly, time spent online most often late at night without parental supervision may engage in online activity that can facilitate delinquency. These specific considerations that define experience in the online domain of everyday life have not been considered in past research but may help to understand how adolescents navigate life online and how this relates to delinquency. Prior studies often exclude important demographic and psychological control variables related to many of the leading crime theories. As a result, it is important to include as many of these variables alongside time spent online for particular activities to assess the role of online activity in delinquency while accounting for all pertinent factors.

Prior research has devoted relatively limited attention to the influence of online victimization on delinquency (however, see Hinduja and Patchin, 2007; Mitchell, Ybarra, and Finkelhor 2007). While a significant body of literature has linked victimization to delinquency, debate continues regarding the causal direction of this link and potential confounding factors that may correspond to both victimization and perpetration (Loeber, Kalb, & Huizinga 2001; Manassee & Morgan Ganem, 2009; Walters & Espelage, 2017). Much of the research on delinquency does not account for victimization experiences that take place both on- and offline, ignoring the potential blend of victimization experiences that many adolescents may face across on- and offline domains. This project assesses the individual influence of victimization experiences for on- and offline forms of delinquency, as well as the association between polyvictimization experiences and

delinquency. Polyvictimization is defined here as the experience of multiple forms of victimization, focusing on the number of *types* of victimization rather than solely the frequency of victimization or the variety of victimization experiences within a given type (Finkelhor, Ormond, and Turner, 2007). Polyvictimization research typically focuses on multiple victimization experiences of family and domestic violence (Finkelhor, Ormond, and Turner, 2007), paying less attention to victimization experiences at the hands of peers and romantic partners that may be central in the social lives of young people.

In sum, although researchers have begun to examine implications for new forms of delinquent and violent behavior related to digital spaces, much of the research has been hampered by limitations of data availability, lack of measure specificity, and an incomplete theoretical approach. Much of the research on online activity and delinquency has focused on delinquent outcomes that take place solely online. A particular focus has been paid to the correlates and effects of cyber bullying, due to a number of high-profile cases in the media involving extreme cyber bullying experiences and subsequent adolescent suicides (Hinduja and Patchin, 2010; Litwiller and Brausch, 2013). While this research is very important, it is also crucial to understand how activity online relates to *offline* delinquency. That is, how does virtual activity translate into real-world delinquency? And conversely, how might in-person experiences (such as victimization at the hands of a bully or intimate partner) affect delinquency online? While a select number of studies have addressed these kinds of cross-domain relationships, most research assesses a single domain of adolescent behavior (online vs. offline) rather than addressing the connection between the two. This project aims to address this gap in the literature. As young people spend an increasing amount of time online, it is no longer feasible to

conceptualize online and the offline spheres of adolescent life as separate and without consequence for one another. Instead, this project explicitly considers the "blurred boundaries" between these domains and the impact this convergence may have on the lives of young people.

This project employs a recent, robust data set developed by the Urban Institute entitled, "Technology, Teen Dating Violence and Abuse and Bullying in Three States." The data include granular measures of a wide range of virtual activities, delinquency, victimization, and forms of cyber aggression. The technological variables measure type of online activity (e.g. social networking, texting, browsing web forums), daily time spent on each activity, the experience of cyber and in-person victimization (bullying and dating aggression), the extent that parents monitor online activity, and when/where the individual spends the most time online. Notably, scholars have underutilized this data set. Few academic papers have been published using these data and the analyses that have taken place have been largely descriptive (Zweig, Dank, Lachman, and Yahner, 2013). Thus, this dissertation is the first study to employ multivariate statistical methods to undertake a more comprehensive analysis of the data.

II. The Expansion of Adolescent Technology Use and Online Activity

The expansion of online technology over the past twenty years has changed the experience of everyday life for many adolescents (DuFour et al., 2014). Online activity is defined here as the use of digital technologies to access the Internet, including computer and mobile devices (e.g. desktop computers, laptops, smartphones, and tablets). Online activities include (but are not limited to) using a social networking site (e.g. Facebook,

Instagram, Twitter, Snapchat), sending and receiving emails, using a search engine (e.g. Google, Bing, Yahoo), reading news online, shopping online, watching videos (e.g. YouTube), blogging and reading user-generated content, playing online games, chatting, and texting (Purcell, 2011). Although global estimates of daily online activity vary substantially depending on the country and group in question (Višnjić et al., 2015), about 95% of adolescents in the United States ages 12-17 are Internet users (Lenhart et al., 2011).

In a survey of American adolescent technology use by the Pew Research Center in 2015, 92% of US teenagers claimed to go online daily and an estimated 25% of those that go online every day say they are online "almost constantly" throughout the day (Lenhart, 2015). Nearly three-quarters of adolescents own or have access to a smartphone, while only about 12% of teenagers do not have access to a cell phone of any kind. Across mobile, computer and video game technologies (e.g. PlayStation, Nintendo, or Xbox gaming consoles with online access), about 70% of teenagers have access to three or four devices, while only 4% indicate access to only one device and 1% have no access to any devices at all (ibid., 2015). Though young people are spending more time online with peers via video game platforms, this project does not focus on console gaming and its influence on delinquency. An increasing body of literature and meta analyses suggest that if violent video games are associated with delinquency or violent behavior at all, the association is relatively small and better explained by alternative factors (Ferguson, Olson, Kutner, and Warner 2014; Ferguson 2015).

Much of the recent increase in online activity among adolescents is attributed to advances in mobile smartphone technology and social media platforms. About 90% of

adolescent cell phone owners now use text messaging in some capacity and those that text send an average of about 30 texts per day (Lenhart, 2015). Roughly three-quarters of American teenagers use social media applications like Facebook, Twitter, Instagram, and Snapchat while about 70% use at least two of these applications (ibid., 2015). Although these are some of the most popular social media platforms available to adolescents, additional social sites including LinkedIn, YouTube, WhatsApp, Kik Messenger, Reddit, and Google+ are popular for adolescents and young adults. Polls indicate that about 20% of all teenagers access their favorite social media site more than 10 times per day (O'Keefe and Clarke-Pearson, 2011). Advances in smart phone camera technology has also pushed online trends towards increased engagement through live video recording via services like Facebook Live, Periscope, Meerkat, and YouTube Live (Stern, 2016). The rapid nature of digital advances and adolescents' willingness to adopt new technology means that researchers may have difficulty assessing the impact of changes, both positive and negative. However, researchers have recently begun to document certain trends regarding the influence of online activities.

Positive and Negative Influence of Online Expansion for Adolescents

Given the rapid adoption of digital technology, a significant part of an adolescent's emotional and social development now takes place online (O'Keefe and Clarke-Pearson, 2011). This can lead to positive experiences that harness online communities to improve personal development and engagement with others. Social media platforms enable young people to stay in touch with friends, share pictures and videos, exchange ideas, and build relationships. Adolescents can now take part in greater community engagement online through exposure to charity and funding opportunities

(facilitated through sites like Kickstarter and GoFundMe); engage in artistic development and exchange; build ideas through blogs, podcasts, and mobile gaming platforms; gain exposure to people from different backgrounds to foster greater respect and tolerance; and find a platform for one's individual skill set and personality (ibid., 2011).

The Internet also affords enhanced learning opportunities, providing adolescents the ability to search and learn about anything through scholarly and non-academic resources. Adolescents can also now access important health information that may not have been readily available before the Internet. This may include medical information on sexual health, diet, and exercise, all of which may help young people lead healthier lives (O'Keefe and Clarke-Pearson, 2011). The expansion of the online world for adolescents has democratized the availability of information, providing equal opportunity for access to resources to any young person with an Internet connection. Undoubtedly, the democratizing nature of the Internet and the potential of social media and mobile applications to foster connections are certainly beneficial to the lives of adolescents as they spend more time online.

While greater time spent online can benefit young people, researchers have also been concerned with the deleterious effects online activity may have on adolescents. Increased time online may subject adolescents to greater risk for online harassment, cyber bullying, and sexting (DeMarco et al., 2017; O'Keefe and Clarke-Pearson, 2011). Physicians have begun to identify "Facebook depression" in adolescents, defined as depression that develops when preteens and teens spend a great deal of time on social media sites, such as Facebook, and then begin to exhibit classic symptoms of depression (ibid., 2011). Some researchers have posited that perceived status imbalance between a

person and their Facebook friends may trigger feelings of mild depression (Blease, 2015), while others continue to deny that Facebook is causally implied in any negative affect (Jelenchick et al., 2013). Adolescents that spend time online may suffer from invasions of privacy or have their online activity follow them into adulthood, which can affect future job prospects, college applications, and interpersonal relationships. Increased time online also subjects the individual to modern forms of advertising including banner ads, demographic target ads, and behavior ads (which track a user's online activity and present ads on the basis of that behavior). These advertisements can have a substantial influence on adolescent buying behaviors as well as the adolescent's perceptions of advertising norms (O'Keefe and Clarke-Pearson, 2011).

The expansion of the Internet into almost every aspect of an adolescent's life has alerted researchers to the development of new Internet-related pathologies such as Internet addiction, compulsive and excessive online behavior, and problematic Internet use (PIU) (Schimmenti, 2017). Excessive time spent online may cause adolescents to withdraw from normal social life, increasing conduct problems, sedentary behaviors, and hyperactivity, especially in males (Mérelle et al., 2017). Internet addiction has also been identified as a risk factor for depression in adolescents (Wu, Li, Lau, Mo, and Lau, 2016; Wu et al., 2016). Thus, behavior related to online activity that has been deemed "pathological" can have negative psychosocial consequences for adolescents (Mérelle et al., 2017).

While there are documented positive and negative outcomes for the increase in online activity for adolescents, recent research has shown that factors such as the type of technology used, individual traits of the adolescent, and the adolescent's social

environment all play a role in determining the kind of influence that online activity has on the lives of young people. Valkenburg and Peter (2009; 2011) assert that factors like gender, personal anxiety, frequency of use, and technology most favored all have a bearing on whether technology use has deleterious or beneficial effects to the individual. In other words, online activity and the use of new screen-based technologies do not take place in a vacuum. Understanding personal as well as environmental factors is required to fully examine how technology use influences behavior like crime and delinquency. Researchers note that if online users are able to benefit from using online technology and improve prosocial communication with others, this may enhance interpersonal relationships and lead to improved well being (Valkenburg & Peter, 2009; 2011). On the other hand, technology use that leads to problems in communication and greater exposure to risk may negatively influence relationships with others and lead to anti-social outcomes and behaviors. It is therefore important to take into consideration not only the extent of online engagement, but also psychological characteristics and the "real" world that surrounds young people to understand the effects of the Internet and the expansion of the digital realm. The following section summarizes the implications of digital experiences for delinquency and adolescent aggression, both on- and offline.

III. The Role of Online Activity for Cyber and Offline Delinquency

There is a limited but growing body of empirical research that examines the relationship between online activity and forms of on- and offline delinquency. The following sections review this research on the effects of online activity for two forms of

cyber aggression (cyber bullying and online dating aggression) and multiple forms of in-person delinquency.

Cyber Bullying

About one in five teenagers have been bullied in some form over the past year (Lenhart et al., 2011), and approximately one in three students report having been involved as a victim or perpetrator in cyber bullying at some point in their lives (Mishna, Khoury-Kassabri, Gadalla and Daciuk, 2012). Cyber bullying includes sending hurtful text messages or emails, persistent online harassment, disseminating rumors online, stealing someone's online identity or posting embarrassing pictures, videos, or fake profiles online (CDC, 2010).

A number of technological factors are associated with cyber bullying, especially since cyber bullying can be pervasive and persistent for those that are continuously using technology throughout the day (Notar, Padgett, and Roden, 2013). A recent meta-analysis found that the frequency of Internet use on screen-based devices is significantly associated with an increase in the risk of both perpetration and victimization of cyber bullying (Kowalski, Giumetti, Schroeder, and Lattaner, 2014). Time spent online, sharing password information with friends, and computer proficiency have all also been positively correlated with both cyber bullying perpetration and victimization (Hinduja and Patchin, 2008; Mishna, Khoury-Kassabri, Gadalla and Daciuk, 2012; Walrave & Heirman, 2011; Ybarra & Mitchell, 2004). Recent research on a sample of Singaporean youth indicates that high use of online activities like chat rooms, bulletin boards, instant messaging, and text messaging may be associated with an increase in the risk of cyber bullying victimization across both computer and mobile platforms (Holt, Fitzgerald,

Bossler, Chee, and Ng, 2014). Some parental monitoring techniques have been found to protect against cyber bullying victimization, including monitoring websites visited and establishing information-sharing rules. However, these effects were found only for boys (Mesch, 2009). Taken as a whole, it appears that greater time spent using computer and mobile technologies, especially across particular virtual activities, is associated with a greater risk of both cyber bullying perpetration and victimization.

Online Dating Aggression

Dating violence is a form of intimate partner violence (IPV) that occurs between two young people in a romantic relationship and can include physical, emotional, psychological and sexual violence in-person or online (CDC, 2016). Twenty-one percent of high school females and about ten percent of high school males in a relationship have experienced dating violence in some form (ibid., 2016). A number of risk factors have been shown to increase the likelihood of dating violence perpetration including aggression towards peers, substance abuse, early sexual activity and multiple sexual partners, and exposure to violence in the home. However, attention has been increasingly paid to the role of new technology in facilitating dating violence (Zweig, Dank, Lachman, and Yahner, 2013). Online or cyber dating aggression can include using a partner's online profile without permission, posting embarrassing photos of a partner online, sending threatening messages to a partner, sending so many messages that a partner feels unsafe, spreading rumors online and a variety of other behaviors (ibid., 2013).

While research on adult IPV can help to inform understandings of teen dating violence, there are distinct differences between these two types of violence. In adult relationships, violence often results from a power imbalance, where a woman may be

dependent on a man and the man takes advantage of this dynamic (Mulford and Giordano, 2008). However, in teen dating relationships, girls typically are not dependent on intimate partners because they do not live with them, do not have children with the partner to protect, and are not financially reliant on the partner. Research indicates that boys and girls in teenage dating relationships perpetrate non-sexual violence equally, a stark contrast to the typical dynamic of IPV perpetration among adults where men are predominantly the abusers (O'Keefe, 2005). Second, teenagers often lack relationship experience and may resort to aggression as a coping strategy to deal with difficulties with a partner (Mulford and Giordano, 2008). Physical or emotional aggression may result from an inability to express properly affection, jealousy, or anger. Inexperienced partners also may hold idealistic views of relationships and resort to aggressive behaviors in the face of conflict. Finally, peers heavily influence adolescents in intimate relationships and friends are often present during conflict between teenage partners (Mulford and Giordano, 2008). Navigating issues around peer influence including how much time is spent with partners versus friends, jealousy from spending time with friends of the opposite sex, and engaging in intimacy according to peer standards all may influence conflict that can lead to aggression between partners (ibid., 2008).

Although the use of online platforms to facilitate romantic communication and to develop relationships between adolescents may positively enhance dating relationships, research indicates that online activity may have negative consequences for teen dating relationships (Valkenburg & Peter, 2011). A recent synthesis of research on technology-assisted adolescent dating violence reports prevalences of victimization between 10% and 30% and of perpetration between 5% and 15%. These findings indicate high rates of

psychological and emotional dating violence via online media and text messaging platforms, alongside demographic, historical, interpersonal and contextual risk factors (Dardis, Dixon, Edwards and Turchik, 2014; Stonard, Bowen, Lawrence, and Price, 2014). Research also shows that the use of technology to engage in dating aggression often accompanies other in-person means of perpetrating dating violence (Korchmaros et al,. 2013). Those that spend more than three hours per day on the Internet and texting have higher rates of psychological dating perpetration than those that spend less time using these media (ibid., 2013). In a qualitative study of 56 adolescents who had experienced dating aggression, computer and mobile technology were used to perpetrate a number of aggressive behaviors, including arguing with a partner, monitoring and controlling a partner, and being emotionally and verbally aggressive (Draucker & Martsolf, 2010). However, positive uses for new technology in dating relationships were also found, including using technology to better establish a relationship with a partner, day-to-day nonaggressive communication, seeking help during a violent episode, and reconnecting with a partner after a breakup (Ibid., 2010). Frequent parental monitoring has been associated with a decreased likelihood of dating violence perpetration in person, although these studies did not include online dating aggression (Foshee et al., 2011; Howard, Qiu, Boekeloo, 2003). While research on the subject is still new, initial evidence indicates that the use of online and mobile technologies plays a role in the perpetration and victimization of teen dating violence.

In-Person Delinquency

Compared to the research on cyber-bullying and online dating aggression, a more limited body of research has examined the relationship between online activity and in-

person delinquency. In-person delinquency is defined here as any delinquent act that takes place in the physical world, or offline. This includes the types of "street" crimes that the majority of criminologists have studied for decades including interpersonal violence, theft, robbery, arson, illicit drug use, sexual assault, vandalism, and homicide.

General Delinquency. Some research suggests that online communication and activity may be associated with an increase in general delinquent behavior. Drawing on Akers' (1977; 1985; 1998) social learning theory, Miller and Morris (2014) found that virtual peer associations with those online have an effect on in-person delinquency and digital piracy in a sample of college students. Peer associations were measured using a set of questions about peer behaviors on- and offline. These behaviors included suggesting doing something against the law, suggesting pirating music or software online, accessing online files without the owner knowing it, and using illicit drugs (for a full list of the behaviors, see Miller and Morris, 2014). The respondent's personal beliefs regarding online delinquency and a measure of cyber delinquency imitation were also used to capture the extent of learned digital behaviors, showing that delinquent virtual peer associations are associated with an increase in offline delinquency (ibid., 2014). Select qualitative studies have also shown the influence of virtual delinquent peers on real world offenses, such as sexual assault and abuse (Holt, Blevins, & Burkert, 2010; Mitchell, Finkelhor, & Wolak, 2007) and prostitution (Holt, Blevins, & Kuhns, 2008; 2014). In these studies, virtual delinquent peers are defined as individuals who a person knows solely through online channels that engage in delinquent behavior (though this behavior may be in-person or online). Holt, Blevins, and Kuhn (2014) analyzed web forum posts by customers of prostitutes to show that they openly discuss methods of decreasing the

risk of getting caught and arrested for solicitation. In many of these instances, peer influence and knowledge about committing certain kinds of crime is transmitted via online communication and then ultimately utilized to carry out both in-person and online crimes. While the men on these chat forums do not know one another in person and only interact online, they are nonetheless influenced by one another's behavior, which appears to have "real world" consequences.

Spending time online also may be associated with an increase in the risk of online victimization, a particularly harmful strain that can result in subsequent delinquency (Agnew 1992; Hinduja & Patchin 2007). Drawing on General Strain Theory and qualitative data, research has shown that adolescents who have been a victim of cyber-bullying have increased behavioral problems in school and a greater likelihood of participating in a range of delinquent acts due to the particular stress of victimization (Hinduja and Patchin 2007). This study utilized a convenience sample of 1,338 adolescents, collecting data on cyber victimization experiences, delinquency, and demographic information. The study found that cyber bullying victimization was associated with an increase in delinquency and that the experience of strain mediated this relationship between cyber victimization and delinquency.

Adolescents who report online victimization in the past year are more likely to engage in delinquency and substance use, as well as experience depressive symptomology, even after controlling for the severity of victimization (Mitchell, Ybarra, and Finkelhor, 2007). The sample for this study consisted of 1,501 adolescents between 10 and 17 years who had used the Internet at least once in the past month, drawn from the First Youth Internet Safety Survey (YISS-1). The researchers measured multiple forms of

online victimization (harassment, sexual solicitation) as well as a range of offline victimization experiences. In particular, online sexual solicitation victimization was shown to substantially increase the risk of substance use. Polyvictimization (experiencing more than one type of victimization experience) is significantly associated with increased odds of delinquency and drug use in the sample. Additional research suggests that significant distress can result from different forms of online victimization such as sexual solicitation, unwanted exposure to sexual material, and harassment, which can lead to delinquent behavior (Wolak et al., 2006). While these researchers have not taken a General Strain Theory approach to explaining the victimization/perpetration link, the studies indicate a connection between the two for both on- and offline victimization.

Offline Violence. Researchers have also examined the "real world" influence of online activity on violence offline. While aggression among young people increasingly takes place online in the form of cyber bullying and online dating aggression (Patton et al., 2014), online activity also may serve to facilitate face-to-face violence and offline delinquency. Research has shown that social media can be a "vector" for youth violence, showing that gang member communicate online to facilitate "cyber-banging" or "Internet-banging" (Patton et al. 2014; Patton, Eschmann, and Butler, 2013). Gangs take part in a wide range of online activities including posting and watching gang-related videos, inciting dares, displaying weapons and drugs, and making fun of recent homicides or victimizations (Decary-Hetu & Morselli, 2011; Pyrooz & Decker, 2011; Patton et al., 2013; Sela-Shayovitz, 2012). These activities may have real-life repercussions by escalating inter-gang conflicts, facilitating weapon and drug exchanges, and generating responses to threats posted online. Research has produced mixed results

regarding whether gangs use social networking sites to specifically recruit new members or coordinate illegal activities. Research on Mexican narcotic gangs shows that although members use social media sites to broadcast images and brag about their exploits, there is no evidence of proactive recruiting strategies taking place online (Womer and Bunker, 2010). However, a different study found that Irish youth gangs use social networking sites to plan inter-gang fights and riots, as well as proactively recruit new members (Decary-Hetu & Morselli, 2011). More research is needed to parse out how online activity may spill over to have real world consequences, especially as it relates to gang conflict and recruitment.

Time spent online also may facilitate other forms of interpersonal violence, such as in-person bullying and dating abuse. Communicating online and via social media has been shown to facilitate and reinforce relationships within the offline world (Subrahmanyam & Greenfield, 2008). Cyber bullying is highly correlated with in-person bullying and conflict that takes place online may spill over into the offline world, leading to further face-to-face conflict (Hinduja and Patchin, 2007). On the other hand, researchers have shown that in-person conflict can perpetuate subsequent cyber conflict. Jang, Song, and Kim (2014) analyzed longitudinal data on young people in Korea, finding that offline bullying victimization results in subsequent cyber bullying perpetration. Thus, certain behaviors in the digital realm and the real world appear to be reciprocal and have effects on one another.

Recent research regarding the influence of online activity on in-person dating violence has shown similar results to the effects on bullying. Electronic communication and experiences using social media can lead to cyber dating violence, which may lead to

physical intimate partner abuse in person. A recent review of the relationship between electronic communication technology and dating violence indicates that conflict between partners may first arise online but carry into offline behaviors that result in offline physical, sexual, and psychological abuse (Stonard, Bowen, Lawrence, and Price, 2014).

Summary. Evidence suggests an association between online activity and multiple forms of delinquent perpetration, both in-person and online. Much more research has been conducted on the relationship between experiences and perpetration within the same domain (e.g. in-person victimization and in-person perpetration), though recent studies indicate spillover between online activity and in-person behavior. Victimization experiences are particularly influential on delinquent behavior and the experience of multiple forms of victimization (polyvictimization) may have additional consequences. Overall, much of the literature on risk factors related to online activity has focused on the total amount of time spent online throughout a typical day. Given this research, the following section draws upon key criminological theories to develop a theoretical framework that further addresses this relationship between online activity and delinquency.

IV. Theoretical Framework

Research on the relationship between online activity and delinquency has relied heavily on social learning and routine activity theories of crime while largely omitting other explanations of crime such as strain and control theories. From a criminological perspective, the relationship between online activity and delinquency is akin to the relationship between family/school/peers and delinquency. Each of these domains may be

associated with more or less delinquency, depending on the nature of one's experiences *within* that domain. Additionally, experiences online may influence real-life outcomes and vice-versa, leading to a "blurring" between two important realms of activity of adolescents. Thus, it is important is to identify the relevant experiences specifically within the digital realm that may be associated with an increase in delinquency and how they relate to experiences in person.

This section outlines four relevant theories of delinquency (strain, social learning, control, and routine activity/opportunity theory) that can be used to assess the relationship between online activity and delinquency. I provide a brief summary of the key tenants of each theory, followed by related variables or questions to consider when assessing this relationship.

General Strain Theory

General Strain Theory (GST) states that exposure to strains in everyday life can lead to negative emotions that individuals may cope with by engaging in delinquency (Agnew, 1992). According to GST, people may fail to achieve their goals, experience negative stimuli, or experience the removal of positive stimuli. These experiences can increase the likelihood of negative emotions including anger, frustration, disappointment, depression, or fear that creates pressure for corrective action. One response to these negative emotions may be to engage in delinquent behavior (Agnew, 2001a). Many criminogenic strains have been identified since the initial development of Agnew's theory including abusive peer relations, criminal victimization, experiences of prejudice and discrimination, parental reject, child abuse and neglect, negative school experiences, and parental supervision that is strict and excessive given the infraction (Agnew, 2001a;

2001b; 2006). Strains that are most likely to result in delinquency are (1) seen as unjust, (2) seen as high in magnitude, (3) associated with low control, and (4) create pressure or incentive to engage in criminal coping (Agnew 2001).

Further research on GST indicates that although crime is only one response to negative emotions, certain individuals may be more likely to cope with strain through delinquent behavior than other behaviors (Agnew and Brezina, 2015). Strain is more likely to lead to delinquency when it involves an area of life that the individual considers important as well as when the costs of delinquent coping are low and benefits are high. Strain is also more likely to lead to delinquency among individuals with poor coping skills and resources and few conventional social supports. Finally, strain is more likely to lead to delinquency among individuals who are disposed to delinquency, or have a preexisting tendency to engage in delinquent behavior. All of these factors influence whether the individual will respond to strain with delinquency. Although research on these conditioning factors is mixed, there is empirical evidence to suggest that at least some of these factors influence how individuals cope with strain (Agnew, 2001; Agnew and Brezina, 2015).

Online activity may lead to strains that directly influence the development of negative emotions. Time spent online may increase the exposure to abusive peer relations online and result in a greater likelihood of becoming a victim of cyber-bullying (Hay, Meldrum, and Mann, 2010). Victimization is one of the strongest types of strain that leads to subsequent delinquent offending and spending large amounts of time interacting with individuals online chatting, texting, or on social media sites may result in more opportunities for cyber bullying (Agnew and Brezina, 2001; Hinduja and Patchin, 2007).

The experience of direct online victimization is likely an especially pertinent strain for subsequent perpetration both on and offline (Mitchell, Ybarra, and Finkelhor, 2007; Hinduja and Patchin, 2007).

Polyvictimization. Online victimization may contribute to an individual's experience of "polyvictimization," or being the victim of multiple types of abuse among peers. Although a significant body of research has been dedicated to the effects of victimization as a strain, studies tend to focus on one type of victimization rather than obtain complete "victimization profiles" to examine how victimization affects individuals across time, space, and different social contexts (Finkelhor, Ormond, and Turner 2007). For example, researchers may examine the effects of child abuse or bullying at school on delinquent outcomes, but these victimization experiences are often assessed separately. Thus, a measurement of polyvictimization is qualitatively different than the measurement of a single form of victimization's frequency. An individual experiencing polyvictimization may be a victim in multiple contexts across different social groups, thereby creating an experience of being "surrounded" by victimization that is not necessarily captured by examining a single type of victimization.

While scholars in social work and public health are familiar with the notion of polyvictimization, it has received less attention in criminological literature (Finkelhor, Ormond, and Turner, 2007). This is especially problematic given how significant a strain a single experience of victimization has been shown within a General Strain Theory framework (Agnew 2001). If one kind of victimization increases the potential for delinquent or criminal coping, it follows that being the victim of multiple forms of abuse, harassment, or crime might create a "compounded" strain that exacerbates the problem

and leads to further delinquent coping. The unique nature of being victimized both in person and online may have a greater influence on delinquency than experiencing victimization in only one of these domains because it creates a strain that is persistent and hard to escape.

Though much of the literature on the effects of victimization on delinquency and trauma has been based on a traumatic stress model (Finkelhor, 1988), more recent research indicates that a pattern of victimization across social contexts may be much more harmful than the experience of a single event (Clausen & Crittenden, 1991). A growing body of research indicates that forms of victimization often cluster together for adolescents, leading to the experience of multiple victimizations over the life course (Finkelhor, Ormond, and Turner, 2007; Nishina & Juvonen, 2005; Rossman & Rosenberg, 1998; Saunders, 2003; Finkelhor, Turner, Shattuck, and Hamby, 2015). Research has examined the connection between the experience of child abuse and witnessing parental violence, as well as clustered experiences of sexual victimization in childhood and later in adolescence (Appel and Holden, 1998; Bowen, 2000; Wolfe, Crooks, Lee, McIntyre, Smith, & Jaffe, 2003). In a recent study, Turner and colleagues (2015) found that adolescents who experience polyvictimization suffer particularly damaging effects because victimization is taking place across multiple domains of the child's life.

Relatively little research has assessed the influence of polyvictimization to include victimization online alongside other in-person areas like school and the home. The experience of cyber bullying or teen dating violence online may add to the strain of experiencing multiple forms of in-person victimization in the home or at school. Peer

abuse or abuse from a dating partner may be especially consequential for adolescents, who may place significant emotional stock in relationships with their peers compared to others in their lives at the time like parents or teachers. Thus, online activity and the unique forms of victimization in the digital realm may contribute to a larger pattern of strain for adolescents.

In addition to the direct experience of victimization and polyvictimization, excessive online activity may also place a strain on interpersonal "non-virtual" relationships if the individual is constantly online and neglecting romantic, family, and peer relationships. It may also expose the individual to harmful or strain inducing content. Finally, online activity may increase indirect strain in young people's lives. I theorize that there are three key areas of strain influenced by online activity, as follows:

Relational Strain. If a given online activity increases communication and ties with conventional others, acts as a means of improving relationships, and leads to positive emotions, it is expected that direct strain would be decreased and the likelihood of engaging in online or offline delinquency would also decrease. On the other hand, if an individual engages in virtual activities that hurt ties to conventional others, degrade interpersonal relationships, and lead to negative emotions through goal blockage or the presentation of negative stimuli, strain would be expected to increase and lead to a greater likelihood of delinquent coping. To assess this, researchers would need to understand the content of the communication taking place online, as well as the context of the individuals that one is talking to online. While relationships facilitated online and their association with delinquency are important for other theories like control theories and social learning theory, the nature of online communication and its impact on personal

relationships may have a particularly important effect on interpersonal or *relational strain*. Exposure to online victimization such as cyber-bullying and online dating aggression may also be particularly consequential for subsequent delinquency both on- and offline.

Content-Exposure Strain. In addition to potentially facilitating online communication and resultant strain, different online activities may expose adolescents to content that can increase or decrease the experience of strain. Exposure to content that leads to positive emotions online via user-generated sites, forums, and blogs may decrease the level of strain experienced online while exposure to content that is upsetting or results in anger may increase the experience of strain. Online activities like research or emailing for school or work may not result in strain because it does not expose an individual to content that leads to negative emotions. However, visiting upsetting or violent websites, spending time on social media where other users post upsetting articles, exposure to "trolling" online, or visiting antisocial web forums related to criminal or deviant behavior and ideologies may all expose the individual to negative content that is upsetting and elicits the need for a coping response.

While exposure to this content is presumably voluntary, younger adolescents using social media or browsing user-generated content may unwittingly be exposed. Even if young people online are not explicitly seeking out negative content that could cause strain, the exposure may nonetheless take place. This is especially possible for those using web forums, aggregated user sites like Reddit and 4Chan, or comment sections on popular sites like YouTube, which are notoriously negative and may be upsetting to young people. Although the data for the current project do not explicitly measure

exposure to negative or violent content, time spent online using social media or browsing user content may increase the likelihood of this exposure and can therefore be approximated using the available measures of online activity.

Relatedly, excessive time spent on social media outlets may experience negative emotions such as jealousy and envy for those that are unhappy with the numbers of "likes" received for status-related posts, a low number of social media "friends," or overexposure to content shared by friends that may create "mean world" views (Davila et al., 2009; Pea et al., 2012; Selfhout et al., 2009; Verduyn et al., 2015). While the results of research on this "Facebook depression" and the negative emotions that stem from social media use are mixed, studies indicate that for some, social media use may act as a strain (Verduyn et al., 2015). Continuous bombardment of frustrating political news, violent or disturbing global news stories, or upsetting opinion content posted by other users on social media may all make an individual feel upset, angry, or have feelings of sadness/depression. Conversely, young people may receive positive benefits from social media "likes" and the acquisition of new social media friends. Positive content exposure online may also reduce strain. Thus, the kind of content that the individual is exposed to online and the frequency of this exposure likely has consequences for the level of strain experienced. While the data available in the present study do not allow for the identification of individuals that may be impacted by this kind of media exposure, this is nonetheless an important theoretical consideration for understanding the relationship between online activity and delinquency. Just as the content of real-world relationships and interactions with others has significant implications for the experience of strain that

can lead to delinquency, the content of a person's "digital life" also matters for understanding experiences of strain.

Indirect Strain. The use of new technologies may also indirectly increase strain for individuals. Excessive time spent online unrelated to school or pro-social activities may influence one's school performance. Those that have a high level of online usage, especially late at night, may not get the amount of sleep needed on a nightly basis, leading to higher emotional sensitivity that can lead to delinquent outcomes both on and offline. Although high use may indirectly increase strain, it may also reduce the likelihood of strain and delinquent coping in certain circumstances. Those that spend time online researching, emailing, or communicating with peers related to school may do well in school and not experience heightened strain. Greater use of technology during normal hours to communicate with peers and maintain positive relationships may have an improved sense of social well-being and receive benefits from continuous communication with peers and family members that reduce strain. Thus, although certain types of online activity may increase strain, moderate use of virtual activities for pro-social activities, relationship building, and goal achievement may decrease the likelihood of delinquency rather than increase it.

Social Learning Theory

A large body of research that has assessed the relationship between online activity and delinquency has employed Akers' social learning theory (SLT) (Anderson et al., 2015; Miller and Morris, 2014). SLT posits that individual differences in crime depend on several key principles of learning that increase the probability of engaging in crime. This includes differential association with others that engage in delinquency or present

favorable attitudes and beliefs toward such, exposure to models of criminal behavior, and the differential reinforcement of delinquency (Akers, 1985).

Akers (1985) posits that individuals learn to engage in delinquency based on the reinforcements and punishments they receive for their behavior. Adolescents are more likely to engage in delinquency when it has been reinforced in the past and there is anticipation that it will be reinforced again. The extent to which reinforcement affects delinquency depends on the frequency, amount, and relative probability of that reinforcement. Reinforcement from peers may also be positive or negative. Positive reinforcement results in something good while negative reinforcement results in the removal of something bad. In either case, continuous, substantial, and expected reinforcement of delinquency is expected to result in continued delinquent behavior. In contrast to the effects of reinforcement, punishment reduces the likelihood that delinquent behavior will be repeated. Like reinforcement, punishment may be positive and involve the presentation of something bad or negative involving the removal of something good.

In addition to the importance of reinforcement and punishment for others, individuals engage in delinquency as a function of the behavior of those around them. Researchers have demonstrated the importance of imitation across survey and experimental studies, showing that individuals exposed to delinquent models – especially those they like/respect and whose delinquency is reinforced – will be more likely themselves to engage in delinquency themselves (Akers, 1998; Akers and Sellers, 2010; Bandura, 1973; 1986).

Finally, SLT posits that peers may teach beliefs favorable to crime, in addition to reinforcing and modeling behavior. Individuals learn to approve of minor delinquency,

conditionally approve of certain kinds of delinquency, or develop values generally conducive to delinquency based on contact with others that hold these values (Akers, 1998). Thus, Social Learning Theory claims that adolescents learn to engage in delinquency from others through a combination of differential reinforcement, imitating delinquent models, and the development of beliefs favorable to crime.

A multi-level, ecological approach is important when assessing the various ways that social learning processes can influence delinquent and aggressive behavior (Heise,1998). Processes of social learning may take place interpersonally between 1) individuals, peers and family members, 2) within the community, and 3) via exposure to media beyond one's own personal relationships and social network. A number of systematic reviews and meta-analyses indicate that beyond exposure to delinquent peers in-person, exposure to violent media increases the likelihood of later violent or aggressive behavior as well as factors related to aggressive behavior including hostile feelings and thoughts (Anderson et al., 2003, 2010; Bushman, 2016; Comstock & Scharrer, 2005). Researchers have also shown that hacker groups as well as persistent digital pirates are typically closely connected to one another and use multiple web forums to gather information, develop social networks, and disseminate the details and methods of cyber crime (Holt, Blevins, and Burrus, 2012; Holt, Soles, & Leslie, 2008; Holt, 2009; Holt & Copes, 2010). Thus, individuals learn the rules and "tricks of the trade" online, sharing insider ways of engaging in different kinds of online crime through personal exchange. The influence of delinquent others and key elements of social learning should be considered when assessing the role of online activity in delinquency.

Direct Learning. Online activities like texting, chatting, and social media platforms may increase the opportunity for two-way interaction that may result in greater likelihood of some of the key behaviors outlined by social learning theory like differential association with and imitation of delinquent models. The increased salience of this exposure due to the interactive nature of particular online technologies may create greater opportunities for learning delinquent behaviors than traditional "one-way" technologies like television and film consumption because interaction is direct and reciprocal. Online activity may therefore facilitate direct association, modeling, and transfer of beliefs favorable to crime. Social media may expose juveniles to others who model delinquency, present beliefs favorable to delinquency, and/or reinforce delinquency.

Indirect Exposure. Individuals may learn to engage in deviant behavior by associating with delinquent peers directly through chatting or texting, as well as indirectly through exposure to delinquent peers on social media sites, blogs, user-based content sites, and message boards. Even if the individual is not communicating directly with a delinquent peer, they may come across delinquent content posted on a forum or as a post on social media shared with the peer's entire social network. Exposure to violent or delinquency affirming content by others may also influence the social learning process and encourage delinquency. Thus, online activity is not just a means of facilitating direct communication between an individual and delinquent peer influences, but also indirectly exposing the person to delinquent associates via one's social network (analogous to an offline community) as well as media that may influence delinquent learning.

While certain kinds of online activity may increase the opportunity for delinquent social learning at multiple levels, it is also likely that certain online activities may lead individuals towards greater engagement with non-delinquent peers and pro-social activities. This would therefore decrease the occurrence of social learning processes and result in a lower likelihood of delinquent behavior. Thus, it is important when considering the relationship between online activity and delinquent outcomes to account for the delinquency of one's virtual peers, exposure to delinquent content via social networks and media exposure, and the actual interactions with others alongside the individual's own activity online.

Control Theories

Alongside elements of strain and social learning theories, it is important to consider the influence of direct and indirect social control when assessing the relationship between online activity and delinquency. As mobile technology has proliferated and more adolescents have access to their own smart phones, it has become harder for parents to directly monitor their children's virtual activity. Parental monitoring of adolescent online activity is a form of direct control and likely has consequences related to delinquent behavior. Parents that check or restrict their children's use of computers or phones, inquire about websites visited, or create specific rules for virtual activity can oversee the adolescent's usage and discuss any problems that may arise. Parents may also install applications like Watchover or Nischint on their children's phones to monitor their activity. Direct control may prevent adolescents from exposure to violent content or delinquent peers, catch potential opportunities for virtual bullying victimization, or simply cut down on the amount of time spent online. However, excessive or overbearing

control may function as a strain, which can lead to delinquency. Thus, adolescents engaged in online activities that are closely and fairly monitored by parents are expected to be less likely to lead to delinquent behaviors or cyber violence online than those that are not closely monitored.

In addition to the direct control afforded by parental restrictions, social controls should also be considered. According to Hirschi (1969), four key social bonds determine the level of social control one experiences: attachment, commitment, involvement, and belief. Attachment is the individual's emotional bond (including love and respect) with conventional others, especially important for a juvenile's relationship with his/her parents or school. Juveniles who hold the opinions of their parents and school leaders in high esteem are more attached to traditional social institutions and cultural norms than those less attached to parents or the school. Commitment relates to the individual's investment in conventional institutions (school, community organizations, etc.). Those who are not committed to adhering to certain social standards will find less consequence for violating norms or breaking the law than those said to be committed. Involvement denotes how much time is spent in conventional activities versus activities related to delinquency and deviance. Involvement with prosocial activities like after-school clubs, sports teams, non-delinquent peer organizations, and family activities results in greater social control and a lower likelihood of engaging in delinquent behavior. Finally, belief refers to the general belief in conventional values and norms in society. Those that identify strongly with the moral norms of a society will be less likely to engage in delinquency, according to social bond theory (Hirschi, 1969).

Of these four social bonds, it is likely that attachment, commitment, and involvement are most closely related to virtual activity. Those that spend a lot of time online may be neglecting face-to-face relationships with family members, romantic partners, or close peers, choosing instead to spend the time online engaged in other activities. However, time spent directly communicating with peers and family members online may increase attachment to others. Thus, it is important not only to understand how much time an individual uses the computer or a mobile device, but also the particular activities that the person is taking part in and the kind of correspondence that the individual has across these activities. Direct online communication that improves relationships and social bonds to others would likely decrease participation in cyber violence while online activities that detach others from their conventional bonds may increase participation in forms of cyber violence.

Different virtual activities may have an effect on one's commitment to important areas of a juvenile's life like school or a job. While texting, messaging, and chatting may not be related to commitment (or may reduce commitment if excessive), spending time online researching for a school project or using email for school or employment-related activities may increase commitment to key social institutions. Conversely, excessive time spent on virtual activities not related to these institutions may decrease commitment and increase the likelihood of delinquency. Excessive time spent online, especially after school or during hours when activities outside of school are held, may result in decreased involvement for adolescents. High use of computers and mobile devices may displace time that could be spent on extra-curricular activities and decrease the individual's commitment to time spent on things outside of school that foster positive bonds with

others and attach the individual to school. However, virtual activity may supplement extra curricular activities in the form of message boards, online meetings, or blog posting regarding a particular interest or club related to school or pro-social areas of adolescent life. Thus, the impact of virtual activity on commitment likely depends on particular elements of the activity including the extent of use, type of use, the time of the day, and the place of use.

In sum, elements of social control related to parental monitoring, attachment, commitment, and involvement should be considered when examining the relationship between online activity and delinquency. Particular forms of direct control should be assessed when examining online activity including the extent of parental monitoring for online activity, limitations placed on parents for mobile and computer use including restrictions on specific websites, and the location/time where online activity is most common. Those online during school or work, or in places outside of the purview of parental monitoring, may be more likely to engage in delinquency due to a lack of indirect social control. Certain online activities like research (for school or homework) and emailing (for school or work) may increase social control and therefore decrease delinquency. However, online activities including peer-to-peer communication like texting or social media use may be associated with an increase in delinquency due to weakened social controls.

Routine Activities Theory

Criminologists have begun to assess the influence of online activity on delinquency using a routine activities approach. Routine activities theory is an environmental, "place-based" theory of crime that focuses on the situational aspects of

crime. This framework theorizes that a crime can only take place if there is a motivated offender, a suitable target, and the absence of a capable guardian. Originally posited by Felson and Cohen (1979), the theory largely ignores characteristics of the offenders and the social determinants of crime. Instead, the theory is informed by human ecological theory (Hawley, 1950) and states that direct contact between perpetrator and victim depends on whether an offender with proper motivation is present to target an available victim without the risk of being caught. Although the theory was developed with physical space in mind as a key determinant of crime, its core elements still apply to "placeless" forms of cyber offending and online activities that may be associated.

Research indicates that routine activities theory is a viable explanation for certain cyber crimes including cyber bullying (Marcum, 2008; Mesch 2009; Navarro and Jasinski, 2012). Greater time spent online may result in more opportunities for cyber delinquency to take place as well as create a space for unstructured peer socialization via social media and messaging platforms (Meldrum and Clark, 2013; Navarro & Jasinski, 2012; Weerman et al., 2013). Osgood, Wilson, O'Malley, Bachman, & Johnston, (1996) have argued that spending time with peers away from capable guardians during adolescence creates situations that lend themselves to delinquency. Relatedly, Meldrum and Clark (2013) indicate that activities like text messaging, chatting, and social media participation may not only lead to online delinquency like cyber bullying but also facilitate offline deviant behavior like substance abuse, drinking, and group delinquency. Individuals may be more likely to engage in delinquency online in the absence of parental monitoring, especially if the virtual activity takes place largely away from the home or if parents do not watch over computer and cell phone activity (Wolfe et al., 2016).

A significant amount of time spent on certain virtual activities may create more opportunities for online delinquency and may facilitate the commission of offline delinquency. Online activities like texting, chatting, using social media, and browsing user content, which may be considered leisurely activities during free time, may put youth in a greater position to engage in cyber delinquency with proximal online victims away from parental monitoring. These activities may also place individuals in direct communication, away from the watching eyes of parents, with one another to facilitate later offline delinquency. Thus, measurements of time spent on particular activities may indicate which online behaviors pose a risk for delinquency using a routine activities perspective.

Stratified Differences – Age, Race, and Gender

Research shows that most of the leading causes of crime and delinquency have similar effects across sociodemographic groups, though significant work has been done to explain overall differences in rates of offending across gender (Bennett, Farrington, and Huesmann, 2005; Broidy & Agnew, 1997; Jang 2007), age (Farrington 1986; Hirschi & Gottfredson, 1983), class (Dunaway, Cullen, Burton Jr., and Evans, 2000; Messerschmidt, 1997), and race (Anderson, 2000; Sampson & Wilson, 1997). However, differences in the general level of the causal or independent variables (compositional differences) often explain the influence of group differences on delinquency, rather than differences between groups in the actual effects of the variables on criminal behavior. Nonetheless, some research indicates certain groups are at greater risk for committing crime. Even after accounting for compositional differences, offending is higher in young

males, those with low socioeconomic status (particularly for serious crime), and African Americans (specifically for violent crime).

For example, men comprise about 81% of all arrests for violent crime and about 65% of arrests for property crime (FBI, 2011). Those between the ages of 15 and 24 account for about 40% of all crimes committed but comprise only 14% of the population (FBI, 2011). African Americans account for about 39% of arrests for violent crime but comprise 13% of the US population (FBI, 2011). Research geared towards explaining these demographic patterns typically draws on structural and institutional arguments related to poverty, racial inequality, masculinity, and life course issues across communities to explain differences in offending (Agnew, 2006; Cooper & Smith, 2012; Hsieh & Pugh, 1993; Laub, Sampson, & Sweeten, 2006; Unnever & Gabbidon, 2011). Given certain demographic differences in offending, it is important to assess how the relationship between online activity and delinquency might change depending on an individual's age, gender, class, or race. Differences uncovered in the influence of online activity on delinquency or the level and nature of online activity across these groups can help to better identify those that are at greatest risk of both perpetration and victimization.

There is relatively little research on demographic differences for online activity and cyber perpetration. The available literature tends to focus on a particular online activity (e.g. social media use) or overall time spent online (Meldrum & Clark, 2015; Perrin, 2015). According to a Pew study of a representative sample of adults (Perrin, 2015), there are few gender differences in reported social media use. Though modest differences were routinely found in research up until 2014, men and women now appear to use social media with similarly high frequency (68% of all women; 62% of all men,

every day). The study noted small racial differences in social media use, indicating 65% White usage, 65% Hispanic usage, and 56% Black usage. However, in a study of young people's Internet usage, Tynes and Mitchell (2013) found that Black youth use the Internet more frequently and are more likely to go online using a cell phone. While young adults (ages 18-29) are shown to have the highest social media usage among adults (Perrin, 2015), there has been little research to compare adolescent differences in activity based on grade or age period. More commonly, the "digital divide" or significant differences in online activity and availability emerge across groups stratified by class, rural/urban status, or immigration status (Haight, Quan-Haase, and Corbett 2014).

Research that examines demographic differences in cyber offending and victimization has yielded mixed results. In many cases, the studies utilize relatively small samples and are not nationally representative (Kowalski, Giumetti, Schroeder, and Lattanner, 2014). The research that has been conducted indicates that boys are more likely to be cyber bullies and that girls are more likely to report male cyber bullying victimization (Li, 2006; Topcu & Erdur-Baker). However, other studies report mixed results or non-significant associations between cyber perpetration and gender (Hinduja & Patchin, 2008; Smith et al. 2008; Ybarra & Mitchell, 2004). Though research on in-person bullying indicates that in-person bullying peaks in middle school (Varjas et al., 2009), there appears to be greater variation for cyber bullying perpetration where some research shows a peak of cyber bullying in eighth grade (Hinduja & Patchin, 2008) and others indicate that it may actually extend into college (Kowalski, Giumetti, et al., 2012; Kowalski, Giumetti, Schroeder, and Lattanner 2014). Research on racial differences in cyber bullying perpetration and victimization follow similar mixed trends. Wang and

colleagues (2009) indicate that African American are more involved in cyber bullying perpetration but less so in victimization than their White counterparts. Conversely, Hinduja and Patchin (2008) find no racial differences in victimization or offending.

Overall, more research is needed to understand whether significant differences exist across demographic groups for online perpetration. Mixed results, small sample sizes, and non-representative studies make it difficult to assess meaningful differences in the literature. While some research has looked at these demographic differences for cyber bullying, no studies have examined demographic differences in victimization or perpetration of online dating aggression. Although a significant body of literature has studied physical and psychological intimate partner violence among adults, online dating aggression among teenagers and adolescents is a relatively new phenomenon that has received little scholarly attention. Given this paucity of research and the mixed results around cyber bullying, the stratified analyses in this project is exploratory in nature, seeking to understand differences regarding the influence of particular online activities or victimization experiences across key group factors.

Summary

A framework for assessing the relationship between online activity and delinquency should account for elements of strain (including victimization opportunities), social learning, indirect and direct control, and routine activities. The complexity and range of virtual activity that adolescents can now engage with requires a nuanced examination of online activity when assessing its association with different forms of delinquency because greater overall virtual activity does not necessarily result in higher likelihood of delinquency. The type of activity, frequency of use, victimization

experiences, exposure to delinquent peers, extent of parental monitoring, time and place most used, and relationship to offline activities and relationships are all important considerations for understanding the effects of online activity on juvenile delinquency. Virtual activities may increase or decrease participation in online delinquency and cyber violence, depending on the nature of such activities and their context. Finally, it is unclear if there are important demographic differences based on group membership related to age, gender, and race that influence the risk of both cyber perpetration and victimization.

V. General Hypotheses

The following hypotheses correspond to the above theoretical framework. These theories are based on the above-outlined theories and prior research. They are general hypotheses regarding criminological theory and expectations for delinquency on- and offline. Although all of these hypotheses cannot be tested using this current project's data, they provide a theoretical contribution and can be used to guide future research. These hypotheses are as follows:

Strain

1. Online activity that increases relational strain between individuals will increase delinquency.
2. Online activity that leads to school problems, such as low grades or failure, will increase delinquency.
3. Online activity the leads to exposure to upsetting and negative content (content-exposure strain) will increase delinquency.

4. Being the victim of cyber bullying or online dating aggression will increase delinquency online and offline.
5. Being the victim of any kind in-person bullying or dating aggression will increase delinquency online and offline.
6. The experience of polyvictimization will increase delinquency online and offline, even after accounting for experiences of individual forms of victimization.

Social Learning

1. Online activities that expose adolescents directly to peers that reinforce delinquent behavior will increase delinquency.
2. Online activities that expose adolescents directly to peers that model delinquent behavior will increase delinquency.
3. Online activities that expose adolescents to peers that have beliefs favorable to delinquency will increase delinquency.

Social Control

1. Online activity that decreases ties to conventional others and social institutions will increase delinquency. Online activities subject to low parental monitoring will be more likely to increase delinquency.
2. Overall closeness to parents will moderate the relationship between online activity and delinquent outcomes.

Routine Activities and Opportunity

1. High daily online activity using social media, texting, chatting, and browsing user content will increase delinquency.

VI. Current Study

Data

All analyses use secondary data from a survey conducted by the Urban Institute in 2011 and 2012 entitled, "Technology, Teen Dating Violence and Abuse, and Bullying in Three States" (Zweig and Dank 2012). The survey was funded by the National Institute of Justice (Grant: 2010-WG-BX-0003). The data were collected to help researchers understand the role of technology use and online activity in teen dating violence and bullying. The survey asks a range of questions regarding the frequency of use of computer and mobile phone technologies. The survey also asks about experiences of dating abuse (both in-person and online), engagement in delinquent activities offline and the extent of cyber and in-person bullying victimization and perpetration. In addition, participants were asked about their demographic backgrounds, psychosocial characteristics, family relationships, and school experiences.

The three-state project surveyed 5,647 7th to 12th grade adolescents about their use of technology and experiences of delinquency, dating violence and bullying in ten schools across five districts in New York, Pennsylvania and New Jersey. The cross-sectional data were collected using a convenience sampling method and paper-and-pencil survey, targeting all individuals that attended school on a specific day. The survey had an 84% response rate. Surveys were conducted in classrooms and administered by school staff trained by the research team. Surveys were collected in October and November 2011 in New York and Pennsylvania and in New Jersey in April 2012.

Though the study uses a convenience sampling method, the sample is relatively diverse in terms of age, gender, and race (although the majority of respondents are White,

male, and high school students). It is typically difficult to collect data on adolescents, especially if the questions are sensitive and pertain to delinquency and victimization experiences. As a result, the data are internally valid (as demonstrated by the constructed measures in the analysis) but lack external validity due to their regional nature and lack of strict sampling methodology. These data, however, provide a unique opportunity to test many of the relationships noted here, especially between online activities, victimization experiences, and delinquent outcomes both in-person and online.

Analytic Hypotheses

While the theoretical framework presented above suggests several hypotheses, it is only possible to test some of them within this project. The data contain rich measurements of perpetration and victimization for delinquency, dating violence, and cyber bullying. In addition, granular measurements are included for a range of online activities, including the amount of time spent daily on each. The data set also contains measures of parental monitoring for online activity and a range of demographic and psychosocial controls. Thus, the key areas that can be tested here relate to the strain of victimization and polyvictimization, time spent on particular activities, and parental monitoring and closeness. It is also possible to test for differences in the models based on key demographic characteristics including age, race, and gender.

It is not possible to test certain elements of the theories presented above regarding exposure to specific types of content online or particular social learning mechanisms. There are no measures of specific websites visited or exposure to violent/upsetting content online. While I use the theories to discuss the relationships found here between certain kinds of online activity and the outcomes of interest, hypotheses regarding these

theoretical components cannot be directly tested. Based on the variables that are available in the data set, the following specific hypotheses will be tested:

Online Activities

1. High daily online activity using social media, texting, chatting, and browsing user content will be associated with an increase in all forms of delinquency due to greater opportunities for delinquent social learning and routine participation in delinquency.
2. High daily online activity researching and emailing will be associated with a decrease in all forms of delinquency due to fewer opportunities for delinquent social learning and routine participation in delinquency.
3. Total time spent on the computer will be associated with an increase in all forms of delinquency.
4. Total time spent using a cell phone will be associated with an increase in all forms of delinquency.

Victimization Strain

5. Cyber bullying victimization will be associated with an increase in all forms of delinquency.
6. Online dating aggression victimization will be associated with an increase in all forms of delinquency.
7. In-person bullying victimization will be associated with an increase in all forms of delinquency.
8. In-person physical dating violence will be associated with an increase in all forms of delinquency.

9. In-person psychological dating violence will be associated with an increase in all forms of delinquency.
10. Victimization experiences of more than three types and four types (polyvictimization) will be associated with an increase in all forms of delinquency, after accounting for all individual victimization experiences.

Parental Monitoring and Closeness

11. Parental monitoring for online activities will be associated with a decrease in the likelihood of all forms of delinquency.

Time and Place of Online Activity

12. The use of mobile phones and computers in one's bedroom will be associated with an increase in the likelihood of all forms of delinquency due to decreased monitoring and direct control.
13. The use of mobile phones and computers late at night will be associated with an increase in the likelihood of all forms of delinquency due to decreased monitoring and direct control.

Measures

Dependent Measures

The analyses are organized into two categories of outcomes: 1) in-person delinquency and 2) cyber aggression. Five types of in-person delinquency are assessed. These include:

- General delinquency
- Drug use
- Bullying
- Physical dating violence
- Psychological dating violence

Measuring In-person Delinquency. All measures used in the construction of the dependent variables are described in the Appendix. All dependent measures for delinquent offending are variety scales, designed to capture the different kinds of delinquency in a given time frame, rather than the frequency of overall delinquency. Variety scales are the preferred method of measuring criminality due to ease of construction, high reliability and validity, and the fact that they are not compromised by high frequencies of trivial offenses (Sweeten, 2012). Internal consistency for each of the perpetration scales is measured using a Cronbach's alpha coefficient (α)[1]. All alpha coefficients presented are from the analytic sample prior to multiple imputation, accounting for all missing data using listwise deletion (N = 2,599). Exploratory and confirmatory factor analysis (EFA/CFA) was not conducted on any of the dependent variables. Though all dependent variables displayed proper inter-item reliability, they are not meant to capture a single underlying construct, but rather represent a total variety of different forms of delinquency. As a result, EFA/CFA is only carried out when a scale included in the analyses is designed to capture an underlying factor. For the present study, EFA/CFA is used only for the construction of a scale to measure overall anger.

A 9-item index is used to create a variety scale of offline delinquency The items include: assault, attempt to steal a vehicle, been arrested, been drunk or high at school, carried a handgun, gotten suspended, sold drugs, taken a handgun to school, and damaged or destroyed property. Responses are coded yes/no for each of the nine items for the past year and then added up to create a scale of delinquency (α = .761).

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[1] Cronbach's alpha is written as a function of the number of items within the scale and the average inter-correlation among the items.

[2] Frequency scales of victimization were also assessed in Chapters 7A and 7B, though no significant model differences were found between using variety and frequency measures. Variety measures of victimization were ultimately used in the final models given

A 9-item measure of drug use variety includes marijuana, hallucinogens, inhalants, amphetamines, pain relievers not prescribed by a doctor, tranquilizers not prescribed for a medical condition, barbiturates, heroin, and cocaine. Responses are recoded as binary measures to indicate any use for each drug within 30 days. The binary measures are then added up to create a variety scale of drug use ($\alpha = .733$).

In-person bullying perpetration is measured using a variety index of 16 items asking about in-person bullying perpetrated in the past year. The items range from teasing and name calling to physical assault and damage of another student's property. Respondents can respond to each item using the following frequency responses: Never, sometimes, once or twice a month, once a week, several times a week, everyday. Each response is recoded to reflect any experience of the item over the past year (no = 0; 1 = yes) and then totaled up to create a scale of in-person bullying ($\alpha = .885$).

Two separate indices are created to measure distinct forms of in-person dating violence: physical dating violence and psychological dating violence (Coker, Smith, McKeown, and King, 2000). Physical dating violence is measured using an index of 16 items asking about experiences of physical abuse from an intimate dating partner in the past year. Responses include: Never, 1-3 times, 4-9 times, 10+ times. Similarly, psychological dating violence is measured using an index of 23 items asking about experiences of psychological abuse from an intimate partner in the past year using the same responses categories as physical abuse. Psychological abuse items comprise a range of behaviors including jealousy, limiting contact with family and friends, insults, and controlling behaviors. Each item within the two dating violence indices are recoded to reflect any perpetration of the item over the past year (no = 0; 1 = yes) and totaled up to

create a variety scale each for physical abuse (α = .856) and psychological abuse (α = .878). Importantly, the survey notes that the abuses should be from someone that the respondent has been in a relationship with, as opposed to another peer, to ensure differentiation between bullying and dating violence. Skip pattern coding is used to account for those that have not been in a relationship.

The second category of outcomes, cyber violence, includes perpetration models for both cyber bullying and online dating aggression. Models are assessed for cyber violence for the following outcomes:

- Cyber bullying perpetration
- Online dating aggression perpetration

Measuring Cyber Aggression. An index of 12 items is used for cyber bullying and a scale of 19 items is used for online dating aggression. Each variety scale measures experiences of bullying and dating aggression within the past year. The cyber bullying measures use the following response categories: Never, sometimes, once or twice a month, once a week, several times a week, and everyday. Cyber bullying perpetration includes online harassment, threats using cell phones and texting, teasing, and misuse of another student's digital account. The online dating aggression measures utilize more specified categories including: Never, 1-3 times, 4-9 times, and 10+ times. Online dating aggression includes posting nude photos online of a partner, pressuring to send texts and nude photos, creating fake digital profiles, and online harassment. The use of technology to engage in the aggressive behavior is included in all questions for these two constructs. The same method of creating a variety scale is used for cyber aggression as in all measures of in-person delinquency. A binary response is created for each item of cyber

perpetration to denote any perpetration vs. no perpetration, and then added up to create a variety scale each for cyber bullying (α = .925) and online dating aggression (α = .833).

Key Explanatory Measures

The main independent variables of interest relate to the amount of time spent engaged in online activities throughout the day, across computers and mobile devices. Respondents were asked to provide the number of hours spent on individual computer activities that include: using social media, chatting, visiting user-generated websites and blogs, posting content, emailing, and researching online. Time response categories include: no time, 1 hour, 2-4 hours, 5-6 hours, 6+ hours. As noted in the analytic hypotheses, it is expected that greater amounts of time spent using social media, chatting, visiting user-generated websites and blogs, and posting content will be associated with an increase in delinquency. This may be a result of increased strain related to the different activities, greater exposure to delinquent peers, and greater opportunity for delinquency (both online and offline). Conversely, emailing and researching are not expected to be positively associated with delinquency since they do not increase strain, expose individuals to delinquent peers, or create opportunity for substantial delinquency. It is expected that these activities will be negatively associated with delinquency, since they may be the result of doing school work or taking part in pro-social activities.

Respondents also provide the estimated number of hours spent on mobile device activities, including time spent: texting, chatting via mobile applications, using social media, and emailing. Response time categories include: no time, less than 1 hour, 1 hour, 2-4 hours, 5-7 hours, and 7+ hours. It is expected that higher amounts of time spent texting, chatting, and using social media on mobile devices will be associated with an

increase of online and offline delinquency. There are very few individuals that spend more than 6 hours on a given activity on the computer, or more than 7 hours on a given activity on a cell phone, which are the two highest categories for the respective devices. Given the low cell counts in these categories, they are combined into a category of "5+" for both computer and mobile activity. Measures of online activity for both computers and mobile devices are utilized as continuous variables in all models.

To explore the possibility of certain online activity's nonlinear influence on different types of delinquency and aggression, dichotomous variables were also created to measure extended amount of time spent on each online activity. While a linear relationship may not exist for certain activities, those that spend a large amount of time on one activity may be at higher risk for different forms of perpetration. To test this for computer activities, time spent on an activity for less than 2 hours is coded as "0" and time spent on the activity for more than 2 hours is coded as "1." This threshold was chosen given the low frequency of respondents that indicated spending more than five hours on a given computer activity. For cell phone activities, time spent on an activity for less than 4 hours is coded as "0" and time spent on the activity for more than 4 hours is coded as "1." This threshold was chosen given that respondents overall spend a greater amount of time online doing cell phone activities than computer activities.

Finally, respondents were asked how much time they spend in general overall on the computer and using a cell phone, separately. Students were asked how much time they spend on computers each day, using the following time categories: no time, 1 hour, 2-4 hours, 4-6 hours, and 6+ hours. Students were asked how much time they spend using a cell phone each day, using the following time categories: no time, 1 hour, 2-4 hours, 5-7

hours, and 7+ hours. These measures are used to assess total time spent online, rather than using measures that add up the amount of time spent for each activity across devices. Given that students may spend time doing activities online simultaneously (e.g. chatting and using Facebook; texting and visiting websites), or overestimate the time spent on a single activity, a self-assessment of total time using a device provides a different perspective on the student's time spent online. These single item responses are used to examine the relationship between total time online and delinquency in an effort to replicate prior work asserting that total time online is associated with increased delinquency (Hay, Meldrum and Mann, 2010; Lee et al., 2014; McCuddy and Vogel, 2015; Meldrum and Clark, 2015; Weerman, Bernasco, Bruinsma and Pauwels, 2013). They are first measured separately alongside all controls, then combined as a single item to represent total time spent online across both devices (range: 0-10).

Additional Technology and Parental Measures

Respondents were asked about the place where they use the computer or mobile device the most. Response categories include: bedroom, other room in the house, a friend's house, school, or other relative's house. Given that use of the computer and mobile device in the bedroom may decrease the parent's ability to monitor the child's online activity, a dummy variable is created to indicate if the respondent goes online the most in his/her bedroom (1) versus all other places (0) for both the computer and cell phone. Similarly, use of the computer or cell phone late at night may also reduce the parent's ability to monitor the child's online activity. Respondents were asked when they go online using the computer and their cell phones most during the day, with the following available response categories: before school, during school, after school (6pm

– 10pm), late at night (10pm – midnight), and middle of the night (midnight – 5am). Students who responded that they go online most "late at night" or in the "middle of the night" are dummy coded (1), compared to all other response categories (0). These measures are important not only for understanding potential effects of lacking parental monitoring, but also as a means of better understanding when and where students are online most often throughout the day.

A measure of parental monitoring is also included all analyses. The survey question asked, "How do your parents or guardians restrict what websites you look at?" with the following available responses: 1) no restriction on Internet use, 2) I am told not to visit certain sites, 3) computer has to be in a public or family space, and 4) filtering software (such as Net Nanny). The variable is recoded into a binary measure to signify no monitoring (0) versus some form of monitoring (1). It is expected that those whose parents closely monitor their children's online activity will be less likely to perpetrate offline and cyber delinquency.

Finally, a measure of parental closeness is included in all models. Respondents were asked two questions: (1) "How close do you feel to the parent or guardian you spend the most time with or live with the most?" and (2) "How much do you think the parent or guardian you spend the most time with or live with the most cares for you?" Response items include: not a lot, a little bit, moderate, quite a bit, and extremely. Responses for the two items were averaged to create a mean score of parental closeness, ranging from zero to four ($\alpha = .769$).

Victimization and Polyvictimization

Respondents were asked about their victimization experiences across five key areas of victimization: in-person bullying, cyber bullying, cyber dating violence, physical dating violence, and psychological dating violence. All victimization questions were formatted in the same way as the corresponding types of perpetration, although they were asked how often the items were done *to* the respondent, rather than done *by* the respondent, over the last year (all measures included in the Appendix). Cyber bullying victimization is comprised of the same 12 items as the perpetration scale, where each item is recoded into a binary indication of ever experiencing that item of victimization over the past year (0 = no; 1 = yes). The items are then added up to create a scale of bullying victimization variety ($\alpha = .901$). The same is done for cyber bullying (12 items; $\alpha = .837$), online dating aggression (19 items; $\alpha = .860$), physical dating violence (19 items; $\alpha = .873$), and psychological dating violence (23 items; $\alpha = .920$). Each of these five victimization scales is included in the second models for each perpetration regression in the first results chapter (7A).[2]

The second results chapter (7B) examines the effects of polyvictimization on delinquency and aggression. Rather than measuring the frequency or variety of a given single type of delinquency, the polyvictimization measure identifies the number of types of victimization experienced across social and online/offline domains. To create a scale of polyvictimization, each of the above five victimization scales are recoded as binary items to indicate if the individual had experienced any instance of that type of victimization over the past year. The five binary items are then summed to create a

[2] Frequency scales of victimization were also assessed in Chapters 7A and 7B, though no significant model differences were found between using variety and frequency measures. Variety measures of victimization were ultimately used in the final models given improved reliability and internal validity compared to frequency measures (Sweeten, 2012).

polyvictimization scale to reflect the variety of victimization types experienced (R: 0 – 5; $\alpha = .679$).

Demographic Covariates

All models include pertinent demographic controls such as gender, age, race, expected grades, and parental education. The controls available are important to hold constant certain group differences that may also be correlated with delinquency. Studies have consistently shown that males commit crime at higher rates than females, especially for violent crime (Bennet, Farrington, & Huesmann, 2005). Gender is operationalized as a binary measure (boys/girls). Although the original coding for the gender measure does include a third category for "transgender/gender-queer" respondents, only 28 of the respondents identified with this category, producing a category *n* that is too small for use in the multivariate models. The age of the respondent is measured on a continuous basis (age ranges from 11 to 21), given life course theories of criminal behavior suggesting that most criminals are young and then age out of crime (Farrington 1986; Hirschi & Gottfredson, 1983). Race is measured as a series of dummy variables including White, Asian, Hispanic/Latino, and Black to control for differences in criminal behavior (Anderson, 2000; Sampson & Wilson, 1997). Two other categories are included in the original survey, mixed race and Native American, but these categories comprise less than 2% of the total survey sample and are thus excluded from the analysis due to low cell counts. A categorical measure of the students grades achieved "in general" is measured using the following categories, where better grades are coded higher: (1) D's and F's, (2) C's and (3) D's, B's, and (4) C's, and A's and B's. This measure of grades is included to control for academic achievement, another significant corollary of delinquency (Maguin

& Loeber, 1996). In later models (Chapter 7C), cyber perpetration models are stratified by three of these key demographic variables: gender, race, and age.

Notably, socioeconomic status (SES) of the respondent or his/her family is not included in the original survey. A school-level measure of school lunch participation was originally included in the survey results but redacted for researchers using the publically accessible data set. In response, a measure of total parental education is included as a proxy for SES given that criminal perpetration has been shown to be associated with class (Dunaway, Cullen, Burton Jr., and Evans, 2000; Messerschmidt, 1997). The adolescent respondents were asked about each of their parents and the highest level of education attained by that parent, ranging from Elementary/middle School to MD, JD, or PhD. The available response categories include: Elementary/middle school (1), high school (2), college (3), Master's degree (4), and MD, JD, or PhD (5). The two categorical responses are then added together to create a total possible response of 0-10 to indicate combined parental education. About 28% of the student sample did not know their parents' highest level of educational attainment or left the response blank, leaving a significant amount of missing data, which was later imputed during the multiple imputation process.

Anger

An index measure of tendency towards anger is included in all analyses. While a mediation analysis cannot be conducted using the cross-sectional data, it is possible that anger resulting from strains experienced using online technology (as noted above) may account for delinquent behavior (Agnew 1992; 2005). This is particularly true given recent research that highlights the negative mental health implications of online activity among adolescent users (Davila et al., 2009; Selfhout et al., 2009). The index measure of

anger includes the following response items: urges to break or smash things; urges to beat, injure, or harm someone; temper outbursts that couldn't be controlled; shouting or throwing things; and getting into frequent arguments. All responses for the anger items use a five-item Likert scale with the following categories: (1) not at all; (2) a little bit; (3) moderately; (4) quite a bit; and (5) extremely. First, exploratory factor analysis (EFA) is carried out using the "factor" command in Stata to examine factor loadings for the five items. All items load onto a single factor above .65 and the single factor Eigenvalue is 2.75, compared to the next highest 2-factor iteration with an Eigenvalue of 0.12. A structural equation model is then run for the five items to create a single latent variable, indicating sufficient fit statistics for a single factor measurement (RMSEA = 0.1; CFI = 0.96; TLI = 0.91). The five items are added together to create an anger scale (R: 0-25; α = .859). While anger often is treated as an intervening variable in criminological and mental health literature, especially within a General Strain framework, mixed results among prior studies suggest that anger may be independently associated with crime (Aseltine, Gore, & Gordon, 2000; Mazerolle et al., 2000; Sigfusdottir, Farkas, & Silver, 2004). In addition, the cross-sectional nature of the data does not allow for time-series or causal analysis to examine anger as a mediating variable. As a result, anger is included to account for potential relationships between the dependent variables and key independent variables (excessive online activity, victimization, etc.).

Additional Covariates Considered

A few potentially important control variables that may have causal effects on both independent and dependent variables are not available in the data set including measures of socioeconomic status, delinquent peer association and self-control. Socioeconomic

status beyond parental education may account for differences in overall levels of criminal perpetration and online activity, especially if SES limits access to computers and cell phones. However, the online activities measured here all account for the availability of online devices, using skip patterns that account for respondents who do not have access to the device. Self-control and delinquent peer association are also variables that could theoretically account for the relationship between victimization and perpetration. Those who are lower in self -control or associate with more delinquent peers may simply have more opportunity or be exposed to greater risk for both perpetration and victimization. Though these controls are important to account for in future research, recent reviews suggest that victimization and perpetration are associated even after accounting for self-control and peer associations (Jennings, Piquero, and Reingle, 2011).

Analytic Strategy

Descriptive univariate results are first reported for all variables in the analyses. These results are described for non-imputed data, indicating the number of missing observations for each variable. This is followed by a correlation matrix for all variables. Multiple imputation is then conducted to create a full dataset that includes all 5,647 observations (imputation process outlined below). Once the imputation process is complete, OLS regression is used to regress each of the dependent variables on all predictors of interest. OLS regression is utilized over the preferred negative binomial regression, which accounts for overdispersion and high frequency of "zero" responses in perpetration measures, due to transformations of the dependent variables that take place during the imputation process. The "mi estimate" command used to estimate models after imputation only enables OLS regression when used with the "mvn" command in Stata for

imputation (used here), which fills in values using multivariate normal regression to impute the values (StataCorp, 2015).

While other imputation commands are available for use with regression estimations for Poisson distributions, these imputation commands did not function properly with the available data during the analysis and the choice was made to utilize an OLS distribution command. As a result, the imputed OLS models here may be biased to assume a normal distribution of the dependent variables. However, the post-imputation results reported here were assessed alongside non-imputed negative binomial models and few differences were found. In practice, researchers have suggested that large differences in results are unlikely across multiple imputation estimations within Stata, as long as the proper assumptions are made regarding the missing data during the imputation process (Allison, 2002; Graham, 2009). The regressions are first conducted on the full survey sample (Chapter 7A). Chapter 7B uses similar methods to focus on the specific experience of victimization versus polyvictimization. The final results chapter (7C) includes a series of stratified models by age, gender, and race to examine demographic differences in the influence of online activities and victimization on cyber perpetration.

Chapter 7A examines the relationship between online activities and all perpetration outcomes across the fully imputed sample (N = 5,647). Descriptive statistics are reported for all variables. Two multivariate models then are estimated for each outcome variable. The first model only includes measures of time spent on computer and mobile phone activities, when and where the student is online the most throughout the day, and whether website access is restricted by parents in any way. These are included to assess the influence of online activity for both on- and offline forms of delinquency. The

second model for each outcome variable is the fully adjusted model, examining all online technology variables in the first model plus each form of victimization, demographic variables, the measurement of anger, and the measurement of parental closeness. A third model was run for each dependent variable, substituting the dichotomous "threshold" online activity variables for the continuous variables to test nonlinear effects. However, given very few differences found between the continuous measures and the threshold measures, these models are not reported in the final results. Any significant differences in significance or effect size are noted in the results. A single model for each delinquent outcome is run, substituting the total amount of time spent using a computer and a cell phone for the granular measures of time spent on each individual activity. Finally, a model is run for each delinquent outcome using a combined measure of total time online for both computers and cellphones. These last two analyses of overall time spent online are done to replicate prior research and compare the influence of individual activities against the total time spent online on delinquency. These models (depicted in Tables 5 and 6) control for all forms of victimization, demographic variables, anger, and the measurement of parental closeness, though only results for the measures of time online are reported.

The second results chapter (7B) assesses a single model for each dependent variable, regressing each type of perpetration on all online, demographic, parental, and anger variables, plus the constructed measurement of polyvictimization. This measure is used in place of the five individual measures of victimization type to examine the effect that compounded forms of victimization have on different types of perpetration both online and offline. Descriptive statistics are reported for polyvictimization, followed by

the seven fully adjusted models. Following this analysis, two dummy variables are used to measure high (3+ victimization types) and very high (4+ victimization types) polyvictimization. Each dummy variable represents whether the individual experienced 3+ or 4+ victimization types, versus not experiencing any victimization. Though the polyvictimization scale ranges from zero to five, a dummy measure could not be constructed for those having experienced all five forms of victimization given low frequency across the sample. The dummy variables are then included in a model for each delinquent outcome alongside all individual measures of victimization to assess the plausibility of particularly high victimization "thresholds," where the experience of significant polyvictimization has an influence on delinquency beyond the additive effects of individual victimization types.

The final results chapter (7C) examines stratified results for demographic groups across gender, race, and age for cyber perpetration. Descriptive characteristics are first reported for all key variables included in the analysis by age group (middle school; high school), gender (boy; girl), and race (Black; White). Each of the two cyber outcomes are regressed on all online activities (both on the computer and via cell phone), time of day and place of use, individual victimization measures, and all demographic variables stratified by age group, gender, and racial group. Two-tailed t-tests using the "test" command in Stata are first used to test for statistically significant differences across groups in the descriptive results. Likelihood ratio tests are used after regression estimations to test for statistically significant differences between coefficients in the multivariate results. The likelihood ratio tests are run to test for differences across all coefficients that are significantly associated with the delinquency outcomes. There is

currently no command in Stata to conduct this test for imputed data and it was therefore created for the task of this analysis. This test is defined as a custom program in Stata for examination of specific coefficients across imputed subgroup models, using the seemingly unrelated estimation or "suest" function typically reserved for non-imputed data. Since very little research has examined stratified differences of online activity and its relationship to delinquency, this analysis is an exploratory assessment of inequalities that may change the influence of online activity on cyber perpetration.

Multiple Imputation

Given significant amount of missing data in the dataset, multiple imputation (MI) is used in Stata 14.2 to generate a full dataset for regression analysis. MI is a flexible simulation-based statistical technique consisting of three major steps: imputation, completed-data analysis, and data pooling to reach a single multiple-imputation result (StataCorp, 2015). MI is derived from a Bayesian statistical paradigm and many researchers have suggested that the number of imputations required for sound analysis ranges between 5 and 20 imputations, though this varies depending on the size of the dataset (Royston, 2004; Rubin 1996; Van Buuren, Boshuizen, and Knook, 1999).

Listwise deletion was initially attempted to account for missing data, discarding all observations with missing values. However, this resulted in a large number of missing observations that may lead to less efficient results when conducting multiple regression techniques (larger standard errors, wider confidence intervals, etc.). After initial listwise deletion, the sample size was 2,599 for a total loss of data of about 54%. Given the amount of data missing and the size of the data set, a 10-imputation strategy was used for the present analysis.

After accounting for skip patterns used in the survey, the missing data are assumed to be missing at random or MAR (StataCorp, 2015). This assumption supports a multiple imputation approach because the missing data mechanism is considered to be "ignorable," thereby enabling correct inference within the imputation step of the analysis. While much of the missing data derives from non-responses related to sensitive behaviors like dating aggression and delinquent behavior in the survey, there is no discernable pattern suggesting a systematic reason for non-response to these items. However, Allison (2002) notes that it is often impossible to be certain of MAR patterns and researchers must often make assumptions prior to imputation. The "mi mvn" command is used for all imputations, which fills in values using multivariate normal regression based on an iterative Markov chain Monte Carlo (MCMC) method to impute the values (StataCorp, 2015). Any missing values are imputed for 3,048 respondents to generate a full sample of 5,647 observations. Missing values are imputed for both explanatory and outcome variables. All regression analyses are run on the complete non-imputed data using listwise deletion as well as the imputed data set containing the full 5,647 observations. In the following sections, all reported results pertain only to imputed data, with notes on differences to non-imputed data where applicable. All coefficients reported in the results chapters have been standardized. All Likelihood ratio tests conducted on imputed data in the stratified results chapter (7C) derive from a custom-created program using the "suest" command for non-imputed data.

VII - A. Results: Online Activity and Delinquent Perpetration

Descriptive Results

All descriptive statistics in the results chapters are reported prior to conducting multiple imputation since these descriptive parameters cannot be estimated for imputed data. Table 1 summarizes all descriptive statistics for the variables used in the analysis. The majority of the sample is female (52%) and white (78%), with a mean age of 15.4. The majority of the participants receive B's and C's (M = 1.43). The mean combined parental education level is 5.87 out of a total possible scale of 10.00, which indicates that two parents have an average of some college experience together. Notably, this variable contained the most missing data (approximately 28% missing), likely due to students not knowing the level of their parents' education. The internal validity of all included scales related to perpetration, victimization, and psychosocial measures is sufficient, given that each is above the commonly-accepted Cronbach's alpha coefficient threshold of 0.7 (Tavakol & Dennick, 2011). Unsurprisingly, perpetration is low across all outcome measures, though it is notably lowest for the two forms of online perpetration (cyber bullying M = 0.23; cyber dating violence M = 0.37). In other words, respondents report an average of less than a single type of cyber bullying and cyber dating violence perpetration over the past year.

Students report spending a total of 1 to 2 hours per day on the computer in a self-report of total time spent (M = 1.76) and between 4 and 5 hours per day on a cell phone (M = 2.58). Recalling the categories of online activity response available to students for computer use (no time, 1 hour, 2-4 hours, and 5+ hours for each activity) and cell phone use (no time, less than an hour, 1 hour, 2-4 hours, and 5+ hours), adolescents spend the

most time on the computer using social networking sites (M = 1.33, or about 1.3 hours each day), followed by reading and research (mean = 0.99, or about an hour) and instant messaging on computers (M = 0.84, or about an hour). Texting is the most frequent activity using mobile phones (M = 2.87, or almost 2 hours), followed by using social networking sites (M = 1.48, or roughly a half hour). About 39% of the respondents indicate that they use their computers most often in their own bedroom and about 33% say the same for their cell phones. About 8% of students use the computer most late at night (after 10pm and throughout the middle of the night) and about 5% say the same for using mobile phones.

Table 1 here.

The highest reported type of victimization is in-person bullying (M = 2.70, or about 3 different types of in-person bullying victimization over the past year) followed by psychological dating violence (M = 2.00) and cyber dating violence (M = 0.93). Cyber bullying is the lowest reported form of victimization with a mean of 0.45 instances over the past year. As noted in Table 1, there is substantial missing data for certain variables, particularly cyber bullying perpetration (missing = 663 missing or 12% of the sample), in-person bullying perpetration (missing = 742 or 13% of the sample), and the two corresponding bullying victimization measures.

Table 2 provides a correlation matrix for all variables used in the analyses. Cells highlighted in green represent correlations close to or above 0.50. High correlations tend to be between different forms of victimization, which is not surprising given prior literature suggesting that victimization types cluster for a given individual (Finkelhor,

Ormond, and Turner 2007). There are also some correlations between 0.50 and 0.65 between certain online activities, which is also unsurprising given that high frequency users for some activities are likely to be high frequency users for others. The only correlation that may be of concern regarding issues of multicollinearity is the relationship between online dating aggression victimization and psychological dating violence victimization (0.76). It is possible that some respondents categorize victimization that takes place online as psychological and therefore experience both forms of victimization, though Cronbach's alphas for inter-item reliability suggest distinct scales for the two forms of victimization (see below).

Table 2 here.

To ensure that multicollinearity was not a problem during the multivariate regressions, variance inflation factor tests were run after all regressions using the "estat vif" postestimation command in Stata. VIF scores of more than 10 for a given variable typically merit concern and can require removal of certain variables to avoid multicollinearity that can inflate standard errors (StataCorp, 2015). Variance inflation factor tests indicate no VIF scores above this threshold of 10 for any independent variables during multivariate analysis throughout this research. For example, in a fully controlled model regressing delinquency on all online activities, time and place most online, parental monitoring, all victimization measures, and all demographic factors, individual VIC scores range from 1.05 (cell phone time most spent late at night) to 3.05 (psychological dating violence victimization). For the victimization measures in

particular, VIF scores typically range from about 1.6 (traditional bullying) to 3.1 (psychological dating violence) across all delinquent outcomes.

Multivariate Results – In-person Delinquency

Following the multiple imputation process, a fully imputed sample of 5,647 respondents is created for all multivariate analyses. All imputed results were compared with the same multivariate models on the non-imputed data (after listwise deletion) to ensure that imputation did not substantially change the results. Any differences for the imputed data versus the non-imputed data are noted throughout the manuscript.

Table 3 shows the results of the multivariate analyses for all offline delinquency outcomes, including general delinquency, drug use, in-person bullying, physical dating violence, and psychological dating violence. For this chapter, the key variables relate to the time spent on different online activities across computer and cell phones, the place and time when the respondent goes online the most, and the measure of website restrictions by parents. All of these variables are included in Model 1 for each outcome, followed by the fully adjusted (F) model that includes measures of victimization, anger, parental closeness, and demographic covariates. The adjusted R-square coefficients for the imputed data in Model 1 for each outcome ranged from 0.029 (bullying) to 0.057 (psychological dating violence). Once all covariates are included, R-square coefficients increase substantially and ranged from 0.198 (drug use) to 0.447 (psychological dating violence).

Table 3 here.

Computer activities. The majority of variables related to time spent on online activity on computers do not have a significant relationship with in-person forms of delinquency. Significant relationships are found for using chat applications and delinquency, (0.072; $p<.01$) as well as in-person bullying (0.051; $p<.01$), but these relationships do not persist in the fully adjusted models. No significant associations are found for using email. Similarly, time spent on blogs and posting content online is associated with a significant increase in physical dating violence (0.054; $p<.01$) and psychological dating violence (0.051; $p<.01$), but the significant association do not maintain in Model 2 for each outcome. Visiting sites containing user-generated content is associated with an increase in general delinquency (0.048; $p<01$) and in-person bullying (0.074; $p<01$), but do not remain significant in the fully specified models.

Notably, using social media is associated with in-person bullying (0.036; $p<.01$) and physical dating violence (0.041; $p<.01$) even after full specification. The one computer-related online activity that has a significant ($p<.01$) and persistent negative relationship with all forms of in-person delinquency is spending time online doing research. Coefficients range in magnitude from -0.039 (drug use) to -0.082 (in-person bullying) for the fully specified models but indicate that time spent researching may be protective against major forms of in-person delinquency. When the threshold measures for computer activity are substituted for the continuous measures, no significant differences are found for the influence of computer activities on in-person delinquency. In the threshold model, high daily use of social media on the computer (2+ hours) is found to be significantly associated with drug use (0.036; $p<.05$), compared to those using social media for less time. No differences are found for in-person bullying

perpetration, though high daily use of chat applications via the computer is associated with physical dating violence (-0.028; $p<.05$). No significant differences are found in the threshold effects models for psychological dating violence.

Cell phone activities. Similar to computer activities, time spent across various online activities on cell phones shows mixed results across variables. Time spent using chat applications is associated with an increase in general delinquency (0.044; $p<.05$) and in-person bullying (0.039; $p<.05$), though neither association remains significant in the fully adjusted models for each outcome. However, using chat applications has a consistently negative association with psychological dating violence, both in Model 1 (-0.046; $p<.01$) and the fully adjusted Model 2 (-0.041; $p<.01$). Time spent using email is negatively associated with general delinquency in the fully specified model (-0.034; $p<.05$), but is not significantly associated with any other outcome. Time spent browsing "other" websites, which can include anything not related to social media, is significantly associated with general delinquency (0.068; $p<.01$) and in-person bullying (0.047; $p<.05$) but not in the fully adjusted models. Using social media on cell phones is only associated with psychological dating violence in the unadjusted model (0.058; $p<.01$). Finally, time spent texting is significantly associated with drug use (0.039; p,.05) and physical dating violence (0.100; $p<.01$) in the unadjusted models, but not the fully models. However, texting is significantly associated with psychological dating violence in both the first model (0.162; $p<.01$) and the fully adjusted model (0.033; $p<.05$), although both the magnitude of the coefficient and the significance level do both decrease once all covariates are included. When the threshold measures for cell phone activity are

substituted for the continuous measures initially used, no significant differences are found for the influence of cell phone activities on any form of in-person delinquency.

Place, time, and parental restrictions. Using the computer most in one's bedroom is not significantly associated with any form of in-person delinquency. Using one's cell phone most in the bedroom is negatively associated with drug use accounting for all covariates (-.027; $p<.01$) and psychological dating violence (0.041; $p<.01$), though the relationship does not maintain in the fully adjusted psychological DV model. Regarding the time of day a respondent is online the most, significant positive associations are found across fully adjusted models for using a computer late at night and general delinquency (0.037; $p<.05$) and drug use (0.041; $p<.05$). A significant association is found for in-person bullying in the first model (0.033; $p<.01$), but the relationship does not maintain after adjusting for all covariates. Using a cell phone most late at night is significantly associated with general delinquency, but only in the unadjusted model (0.045; $p<.01$). However, a significant association is found between using a cell phone most late at night and psychological dating violence, both in the unadjusted (0.048; $p<.01$) and the fully adjusted model (0.028; $p<.01$). Finally, parental restrictions on websites visited has a significant negative association with general delinquency (-0.035 $p<.01$) and drug use (-0.034; $p<.05$), accounting for all covariates in the fully specified models. Significant associations are also found for in-person bullying (-0.035; $p<.01$), physical dating violence (-0.042; $p<.01$), and psychological dating violence (-0.037; $p<.01$), though these associations do not hold after including all covariates in the fully adjusted models.

Victimization. Fully adjusted models for all delinquent outcomes include five continuous measures of victimization: in-person bullying, cyber bullying, cyber dating

violence, psychological dating violence, and physical dating violence. Most forms of victimization, both on- and offline, are significantly and positively associated with a range of in-person delinquent outcomes. In-person bullying is associated only with bullying perpetration (0.252; $p<.01$). However, cyber-bullying victimization is significantly associated with multiple types of in-person delinquency including drug use (0.072; $p<.01$), in-person bullying (0.123;$p<.01$), physical dating violence (0.079; $p<.01$), and psychological dating violence (0.089; $p<01$). Cyber dating violence victimization is significantly associated with general delinquency (0.110; $p<.01$) and drug use (0.139; $p<.01$), but no associations are found for in-person bullying or either type of dating violence perpetration.

Psychological and physical dating violence have significant relationships each with four of the five delinquent outcomes assessed here. Being the victim of psychological dating violence is negatively associated with in-person bullying (0.049; $p<.05$), physical dating violence (0.162; $p<.01$), and psychological dating violence perpetration (0.547; $p<.01$). However, it is negatively associated with drug use (-0.151; $p<.01$). Physical dating violence victimization is persistently and positively associated with all forms of in-person perpetration, ranging in magnitude from 0.058 (psychological dating violence) to physical dating violence (0.497). All associations for physical dating violence victimization and forms of delinquency are significant at the $p<.01$ level.

Demographic covariates. Being older is significantly associated with all forms of delinquency except in-person bullying (coefficient range: 0.026-0.114) and being female is negative associated with general delinquency (-0.148; $p<.01$), drug use (-0.064; $p<.01$), and in-person bullying (-0.146; $p<.01$). However, being female is positively associated

with both physical (0.84; $p<.01$) and psychological (0.059; $p<.01$) forms of dating violence. Regarding race, mixed effects are found across racial groups. Being black is positively associated with both general delinquency (0.049; $p<.01$) and physical dating violence perpetration (0.032; $p<.01$), while being Hispanic is also positively associated with general delinquency (0.037; $p<.01$) and physical dating violence (0.030; $p<.01$). Better expected grades are negatively associated with three forms of delinquency: general delinquency (-0.155; $p<.01$), drug use (-0.131; $p<.01$), and in-person bullying (-0.032; $p<.01$). However, grades are not associated with either form of in-person dating violence. Finally, combined parental education, the approximation of SES used in these analyses, is only associated with in-person bullying perpetration (0.046; $p<.01$).

Anger and parental closeness. In addition to the demographic covariates included in the fully specified model for each delinquent outcome, measures of anger and parental closeness also are included. Unsurprisingly, greater levels of anger are significantly and positively associated with all forms of delinquency with coefficients ranging from 0.082 to 0.206 (all significant at $p<.01$). Parental closeness is negatively associated with both general delinquency (-0.068; $p<.01$) and drug use (-0.077; $p<.01$). However, it is positively associated with both psychological (0.036; $p<.01$) and physical (0.030; $p<.01$) dating violence, though the magnitude of the effects are small.

Summary. Overall, individual computer activities are largely not associated with in-person delinquency after accounting for all factors in the full models. However, some important exceptions are found. Regarding Hypothesis 1, social media on the computer is positively associated with both in-person bullying and physical dating violence, though the standardized effects are small (under 0.1). For Hypothesis 2, research using a

computer is negatively associated with all forms of in-person delinquency, though the effect sizes are also small. Cell phone activities are not generally associated with delinquency accounting for all factors. In regards to Hypothesis 12 and 13, factors like using the computer late at night and restrictions on websites by parents are associated with different forms of delinquency with typically small effect sizes. While individual online activities and technology variables don't appear to substantially influence in-person delinquency across the board, it appears that certain activities do matter for particular outcomes, use late at night can influence delinquency in some contexts, and parental monitoring generally matters for most forms of delinquency. Since these general measures of time spent across each activity do not illustrate the particular context of online interactions or actual content consumed, it may be that negative experiences online need to be more specifically measured to uncover influence on delinquency. Ideas for future research related to this issue are addressed in the Discussion.

Different forms of victimization appear to be much more influential across in-person delinquency outcomes than individual online activities. In support of Hypothesis 6, 8, and 9, experiences of dating violence victimization online, physically, and psychologically have an especially substantial influence on perpetration. This is notable given that little attention has been paid to teen dating violence and aggression, both on- and offline. As expected, control factors like expected grades and anger are significantly associated with most forms of in-person delinquency. With these results in mind, the following section examines these factors for cyber delinquency.

Multivariate Results – Cyber Delinquency

Table 4 displays the multivariate results for two outcomes related to online delinquency: cyber bullying and online dating aggression. Model 1 for each of the two outcomes regresses the dependent variable on measures of online activity (computer and cell phone), the time and place where respondents are online the most, and the measure of parental restrictions on websites visited. The second fully adjusted model adds victimization measures, demographic covariates, anger, and the measure of parental closeness. Adjusted R-square coefficients increase substantially for both outcomes (0.024 to 0.223 for cyber bullying; 0.049 to 0.365 for online dating aggression).

Table 4 here.

Computer activities. Specific online activities using the computer are largely not associated with forms of cyber delinquency. Chatting is significantly associated with cyber bullying (0.050; $p<.01$) but the effect does not hold in the fully adjusted model. This same association is found between blogging/posting content online and cyber bullying (0.059; $p<.01$, unadjusted model). However, blogging/posting content online is significantly associated with online dating aggression, even after accounting for all covariates (0.028; $p<.05$). As in the case of in-person delinquency outcomes, time spent researching online has a persistently negative association with cyber bullying (-0.051; $p,.01$) and online dating aggression (0.060; $p<.01$) across both fully adjusted models. No significant associations are found for social media or visiting sites containing user-generated content. When the threshold measures for computer activity are substituted for the continuous measures, high activity for chat applications via the computer is

associated with an increase in cyber bullying perpetration (0.034; $p<.05$) and the negative influence of research and emailing are no longer significantly associated. No significant nonlinear relationships are found between computer activities and online dating aggression.

Cell phone activities. Certain online activities using cell phones are associated with cyber delinquency and aggression. Though not significantly associated in the unadjusted model, using chat applications on cell phones is negatively associated with dating aggression in the final model, accounting for all covariates (-0.043; $p<.01$). Spending time using email on mobile devices is significantly associated with cyber bullying perpetration accounting for all covariates (0.034; $p<.01$), but not with online dating aggression. Texting is positively associated with dating aggression in the unadjusted model (0.104; $p<.01$), but the relationship is not significant after account for all other factors. No significant nonlinear relationships are found between cell phone activities and either cyber outcome.

Place, time, and parental restrictions. Using the computer or cell phone most in one's bedroom is not associated with either form of cyber delinquency. Using the computer late at night is positively associated with online dating aggression in the initial model (0.038; $p<.01$), but the relationship does not persist in the fully adjusted model. Likewise, using a cell phone most late at night is positively associated with online dating aggression in Model 1 (0.032; $p<.01$) but the association does not hold after accounting for all covariates. Finally, parental restrictions on websites visited is negatively associated with cyber bullying perpetration, both in the initial model and the fully adjusted model (-0.031; $p<.05$). Though significant, this is a small effect.

Individual victimization types. The results for different forms of victimization indicate that both online and offline types of victimization are significantly associated with online perpetration. While in-person bullying victimization is not significantly associated with cyber bullying perpetration, it is negatively associated with online dating aggression (-0.037; $p<.05$). Cyber bullying victimization is significantly associated with both cyber bullying perpetration (0.387; $p<.01$) and online dating aggression (0.188; $p<.01$). Cyber dating violence victimization is not associated with perpetrating cyber bullying, however it is significantly associated with cyber dating aggression (0.413; $p<.01$). No significant associations are found for psychological dating violence victimization, however being the victim of physical dating violence is positively associated with both cyber bullying perpetration (0.125; $p<.01$) and online dating aggression (0.132; $p<.01$).

Demographic covariates. Being older is significantly associated with online dating aggression (0.026; $p<.05$), but not with cyber bullying. Girls are less likely to engage in cyber bullying (-0.057; $p<.01$), but no gender effects are found for online dating aggression. Few effects were found related to racial group membership, though a significant association for black respondents and online dating aggression is found (0.032; $p<.01$). Better grades are negatively associated with cyber bullying perpetration (-0.033; $p<.01$), though no grade effects were found for online dating aggression. Finally, greater parental education is associated with cyber bullying (0.030; $p<.01$), but no effects were found for online dating aggression.

Anger and parental closeness. Greater levels of anger are associated with both cyber bullying perpetration (0.062; $p<.01$) and online dating aggression (0.051; $p<.01$).

The respondent's level of closeness with their parents is not associated with either type of online delinquency.

Summary. To test Hypothesis 1 and 2 for online delinquency, measures of cyber bullying and online dating aggression are regressed on all online activity measures. Partial support is found for both hypotheses, suggesting that particular activities like blogging/posting online, research, using chat applications, and emailing influence online delinquency after accounting for all other factors. Similar to the assessment of online activities on the computer, significant relationships appear to depend largely on individual activities and their association with particular delinquent outcomes. Thus, the results are not "one size fits all" for delinquency across the board, but rather dependent on particular delinquent contexts. Small effects are found for the influence of parental monitoring (Hypothesis 11), though time and place most spent online generally does not influence online delinquency (Hypothesis 12 and 13). Most victimization experiences are associated with an increased likelihood of cyber bullying and online dating aggression, offering support for Hypotheses 5-9.

Total time spent online. Though certain online activities influence some forms of delinquency, a final set of models is run to test prior research indicating that the total amount of time in general is associated with increased delinquency. Hypotheses 3 and 4 assert that overall time spent on the computer and cell phone will be associated with an increase in the likelihood of delinquency in person and online. To test this, Table 5 depicts the results for these two general measures of time spent online using a computer and using a cell phone for all delinquent outcomes. These models control for all factors included in the models reported in Tables 3 and 4. A significant, negative association is

found between total time spent on the computer and general delinquency (-0.037), drug use (-0.39), and psychological dating violence (-0.030). On the other hand, significant and positive associations are found between total time spent using a cell phone and general delinquency (0.045), drug use (.063), and in-person bullying (0.039). No significant associations are found between total time spent online and any other forms of delinquency. The magnitude of the effects are relatively small, but suggest that spending time on the computer may be associated with a *decrease* in delinquency, whereas time spent on a cell phone may be associated with an *increase* in delinquency.

Table 5 here.

Table 6 shows the results for a single measure of time online, combining the two measures for total time using a computer and a cell phone. Controlling for all other factors, an association is found between total time spent online and in-person bullying (0.043; $p<.01$). No significant associations are found for any other delinquent outcomes. This makes sense given that the results in Table 5 show that computer and cell phone time online are directionally associated with delinquency in opposite ways, which might negate one another in a combined measure. These results suggest that it is important to separate out how young people are spending their time online, rather than creating a simple aggregate measure that might not pick up the nuances of particular online behaviors.

Table 6 here.

Chapter Summary. Time spent on particular online activities influences certain types of delinquent outcomes. Thus, mixed support is found for Hypotheses 1-4. Certain activities like researching on the computer, using social media, using chat applications, browsing non-social media websites, and texting influence particular types of delinquency and aggression in person, even accounting for all other factors. Even in instances where significant relationships were found, generally small standardized effects below 0.1 are found. Likewise, certain activities like blogging and researching on the computer, as well as using chat applications and emailing on cell phones are associated with online forms of aggression. There are also isolated effects for using the computer and cell phone late at night, as well as parental restrictions on the respondent, depending on the outcome of interest. These results offer mixed support for Hypotheses 11-13. Typically, the effect sizes found for these associations are also small, though significant. Similarly, small effects are found for the influence of total time spent on the computer (negative) and a cell phone (positive) across certain delinquent outcomes. Total time online, including both computer and cell phone activities, is generally not associated with forms of delinquency (with the exception of in-person bullying).

Though online activity may not have a major influence across the board for all forms of offending for adolescents, the type of online activity and certain circumstances around online use do appear to have some bearing on delinquency. Thus, a key takeaway is that researchers or practitioners trying to understand the influence of online activity on children's behavior should not treat all online activity equally. Future research should consider obtaining more information on the nature of online activities, including the content of peer communications, networks of peer associations and relationships

including delinquent peers, and particulars of the actual online activity (e.g. applications used, websites visited).

Some of the most robust relationships found are around individual forms of victimization, on- and offline, and delinquent outcomes, providing substantial support for Hypotheses 5-9. Importantly, forms of cyber victimization are significantly associated with in-person delinquency, while forms of in-person victimization are significantly associated with online delinquency. This suggests that as time spent online increases, young people may carry the experiences they have in from domain into another. Therefore, the reciprocal relationship between the digital domain and the "real world" should be seriously considered when trying to understand how victimization is associated with perpetration. The following chapter examines the specific influence of polyvictimization, or the experience of multiple forms of victimization on- and offline, on forms of delinquency and aggression.

VII - B. Results: Polyvictimization

Descriptive Results

While the results of the first results chapter (7A) indicate significant associations between various forms of victimization, on- and offline, the second results chapter (7B) assesses the distinct role of polyvictimization in delinquent and aggressive perpetration. The five measures of victimization demonstrate significant associations across perpetration types in Chapter 7A and encourage further investigation of their unique influence on delinquency and aggression. The polyvictimization measure is used here to assess the variety of victimization types that the individual has experienced across online

and offline domains. The five victimization types include: (1) in-person bullying, (2) cyber bullying, (3) online dating aggression, (4) psychological dating violence, and (5) physical dating violence. Table 7 provides the univariate statistics for each unique form of victimization, followed by the measure of polyvictimization. The most common form of victimization is offline, or in-person, bullying (M = 2.70), followed by psychological dating violence (M = 2.00), and cyber dating aggression (M = 0.94). The least common form of victimization is cyber bullying (M = 0.46). Across the five total victimization types that may be experienced, the average respondent reports experiencing a mean of about 1.5 types or "forms" of victimization over the past year (SD = 1.5).

It is notable that these victimization types measured here represent only the five available in the data set. The polyvictimization composite provides a relatively robust picture of interpersonal victimization at the hands of peers and dating interests, though it does not include any measures of criminal victimization or victimization in the home by family members. However, these victimization types capture distinct experiences across different social domains for adolescents, both on- and offline. A measure of polyvictimization provides a *qualitatively* different look into the experience of victimization because it measures how an individual is victimized across these domains and may experience abuse at the hands of peers in school, during free time after school, and at home through online means. A person who experiences multiple forms of victimization may be encapsulated in the stress of peer abuse and have a harder time escaping that abuse if it is occurring across multiple domains. For instance, if an individual is being bullied at school, abused in some form by a dating partner, and also dealing with bullying and dating abuse through online means, that person may feel like

they are unable to escape feelings of victimization and may cope through delinquent means. Given that victimization is a substantial strain that is high in magnitude and central to an individual's well-being, polyvictimization and the experience of abuse that is difficult to get away from may be especially pertinent for delinquent and aggressive behaviors.

Table 7 about here.

Table 8 breaks down the experience of polyvictimization for respondents. About 30% of the respondents indicate no victimization experiences over the last year, while another 30% reports experiencing one type of victimization. The remaining 40% of the respondents indicate some form of polyvictimization (2 or more forms of victimization experienced over the past year). About 17% report two forms of victimization, 12% report three forms of victimization, 9% report four forms of victimization, and about 4% report experiencing all five types of victimization over the past year. High polyvictimization, or the experience of three or more types of victimization, is experienced by about 25% of the sample while very high victimization (4+ victimization types) is experienced by about 13% of the sample.

Table 8 about here.

Multivariate Results – Part I

Table 9 depicts the multivariate results for the relationship between polyvictimization and each form of delinquency. Net of all measures of online activity (computer and cell phone), demographic factors, anger, and parental closeness, positive

significant associations are found between polyvictimization and each perpetration variable. The size of the relationship varies substantially, with standardized regression coefficients ranging from 0.133 for drug use ($p<.01$) to 0.469 for psychological dating violence ($p<.01$). In between, polyvictimization is positively and significantly associated with general delinquency (0.160; $p<.01$), in-person bullying (0.275; $p<.01$), physical dating violence (0.374; $p<.01$), cyber bullying (0.187; $p<.01$), and online dating aggression (0.363; $p<.01$), respectively. Based on the estimated adjusted R-square coefficients, the model with the greatest proportion of variance explained relates to psychological dating violence as an outcome (adj. R-square = 0.314), while the model with the lowest proportion of variance explained relates to cyber bullying (adj. R-square = 0.090).

Table 9 about here.

Figures 1 and 2 depict the estimated marginal effects for the relationship between each category of polyvictimization (from zero types of victimization to all five types) and the delinquent outcomes. Figure 1 shows the results for all five forms of in-person delinquency while Figure 2 demonstrates the marginal results for each of the cyber outcomes. Given that each of the outcomes were constructed using scales that vary in number of items (ranging from 9 for general delinquency to 23 for psychological dating violence), the margins coefficients were standardized by dividing each by the number of items in each of the dependent variable scales. This results in a standardized scale of delinquency, allowing each of the outcomes to be mapped alongside one another on in a single graph.

Figure 1 indicates that delinquency and in-person aggression increases as the number of victimization types increase. The association is particularly strong for bullying and psychological dating violence. For both psychological dating violence and physical dating violence, there is a substantial increase in size of effect once the number of victimization types experienced exceeds three types. This observation suggests a potential non-linear effect where the effect of polyvictimization across on- and offline domains has particularly deleterious effects for aggressive and delinquent outcomes in person.

Figure 2 depicts the predictive estimates for the relationship between each level of polyvictimization (or number of forms of victimization experienced) and the two forms of cyber perpetration: cyber bullying and online dating aggression. The graph indicates similar results for the in-person models depicted in Figure 1. As the number of victimization types experienced by the respondent increases, perpetration variety increases for both cyber bullying and online dating aggression. As in the case of in-person psychological dating violence and physical dating violence, the relationship is particularly strong if the respondent has experienced a high number of victimization types (4 or 5 types). Compounded victimization appears to be particularly harmful in regards to risk for perpetration of aggression against a dating partner online.

Finally, Figures 3 and 4 depict the predictive estimates for the relationship between polyvictimization and the two forms of cyber perpetration, by gender. As the number of victimization types increase, boys are more likely to perpetrate cyber bullying than girls. The gap between rates of perpetration increases as polyvictimization increases across gender lines. However, the results differ for online dating violence. Girls have

slightly higher rates of online dating violence perpetration when experiencing one, two, or three types of victimization. However, boys begin to have higher rates of perpetration than girls after experiencing very high polyvictimization (four and five types, respectively). The gap in perpetration rates is relatively small for the experience of four victimization types, but it widens substantially between boys and girls for those that have experienced all five types of victimization. This suggests that although polyvictimization largely influences perpetration of dating violence across gender lines similarly, particularly high polyvictimization may push boys towards dating violence perpetration online mores than girls.

Computer activities. When the measure of polyvictimization is included in the delinquency models, as opposed individual forms of victimization, there are relatively few significant associations between time spent on computer activities and forms of delinquency and aggression. No effects are found for using chat applications or time spent using email. Time spent on blogs and posting online is associated with an increase in cyber bullying (0.051; $p<.01$) and online dating aggression (0.056; $p<.01$). Time spent on the computer researching is consistently and negatively associated with all forms of delinquency, both on- and offline. The effect sizes range from -0.049 (drug use) to online dating aggression (-0.073). Social media use on the computer is associated with both bullying (0.036; $p<.05$) and physical dating violence (0.041; $p<.05$), though no effects are found for either form of online aggression. Finally, a modest relationship is found for visiting websites with user-generated content and in-person bullying (0.032; $p<.05$).

Cell phone activities. Similar to online computer activities, sporadic significant relationships are found between particular cell phone activities and all forms of

delinquency and aggression. A modest yet significant negative association is found between the use of chat applications and both psychological dating violence (-0.036; $p<.05$) and online dating aggression (-0.036; $p<.05$). Time spent using email on cell phones is positively associated with cyber bullying (0.051; $p<.05$) and the use of "other websites" is associated with an increase in both general delinquency (0.036; $p<.01$) and drug use (0.047; $p<.01$).

Place, time, and parental restrictions. Spending time online most in one's bedroom is generally not associated with any form of delinquency. The one exception to this is the relationship between using one's cell phone most in the bedroom and psychological dating violence. A significant positive association is found between these two measures (0.013; $p<.01$). For those respondents who spend their time most online using the computer late at night, a significant positive association is found for both general delinquency (0.044; $p<.01$) and drug use (0.053; $p<.01$). However, no significant relationships are found between using a cell phone most late at night and any form of delinquency or aggression. Parental restrictions on website access are negatively associated with general delinquency (-0.033; $p<.01$) and drug use (-0.032; $p<.01$). No relationship is found for any of the other outcomes of interest.

Demographic covariates. Being older is associated with the majority of perpetration outcomes including general delinquency (0.043; $p<.01$), drug use (0.111; $p<.01$), physical dating violence (0.034; $p<.01$), psychological dating violence (0.086; $p<.01$), and online dating aggression (0.027; $p<.01$). Gender has a significant relationship with all outcomes except online dating aggression. Being an adolescent girl is negatively associated with the majority of in-person outcomes including general delinquency (-

0.163; $p<.01$), drug use (-0.088; $p<.01$), and bullying (-0.149; $p<.01$). However, being an adolescent girl is associated with greater exposure to physical dating violence (0.045; $p<.01$) and psychological dating violence (0.078; $p<.01$). Finally, being an adolescent girl is negatively associated with cyber bullying (-0.025; $p<.01$).

Certain racial factors have significant relationships with individual perpetration outcomes. Being Black is associated with general delinquency (0.055; $p<.01$), physical dating violence (0.044; $p<.01$), psychological dating violence (0.025; $p<.05$), and online dating aggression (0.047; $p<.01$). Being White is negatively associated with physical dating violence (-0.033; $p<.05$), while being Hispanic is not associated with any of the delinquent or aggressive outcomes of interest. Better expected grades are significantly and negatively associated with general delinquency (-0.158; $p<.01$), drug use (-0.136; $p<.01$), and bullying in person (-0.030; $p<.05$), as well as cyber bullying (-0.034; $p<.05$). Finally, greater parental education is associated with bullying (0.049; $p<.01$) and cyber bullying (0.028; $p<.05$), but no other outcomes.

Anger and parental closeness. Anger is positively and significantly associated with all perpetration outcomes, both on- and offline. The standardized coefficients range from 0.087 for online dating aggression to 0.259 for in-person bullying ($p<.01$ for all coefficients). Parental closeness is negatively associated with a number of perpetration outcomes including general delinquency (-0.071; $p<.01$), drug use (-0.083; $p<.01$), bullying (-0.035; $p<.01$), and cyber bullying (0.030; $p<.05$). However, parental closeness is unexpectedly positively associated with psychological dating violence (0.028; $p<.05$).

Summary. The results suggest a significant and substantial association of polyvictimization with all forms of delinquency. The measure includes both on- and

offline forms of victimization, suggesting that those who experience victimization across both digital and "real world" domains may be at the greatest risk for perpetration. The effects appear to be particularly consequential for dating violence perpetration, suggesting a potential threshold effect where particularly high experiences of victimization result in greater perpetration of physical, psychological, and cyber dating violence. These results corroborate prior research on the deleterious effects of polyvictimization using a measure of different *types* of victimization, rather than frequency or variety of a single type.

Multivariate Results – Part II

Though the analysis of the polyvictimization measure used above indicates a strong relationship with all forms of delinquent assessed here, I also consider whether this is simply measuring the additive effects of multiple types of victimization. Therefore, I examine the effect of polyvictimization here alongside controls for the individual measures of victimization to test Hypothesis 10, which asserts that polyvictimization will be associated with an increase in the risk of delinquency after controlling for individual victimization experiences. Two measures are created to test this: 1) a dummy measure of experiencing 3+ types of victimization over the past year or 2) a dummy measure of experiencing 4+ types of victimization over the past year. The first measure is an estimation of "high polyvictimization," while the second measure is an estimation of "very high polyvictimization." A model is run for each delinquent outcome including all individual victimization types, plus each of the two dummy measures of high and very high polyvictimization. Though prior research on the relationship between polyvictimization and trauma indicates that only about 10% of individuals experience

very high polyvictimization, it is possible here to test different thresholds of the influence of peer victimization across types using both of these dummy variables in the same models (Turner, Finkelhor, and Ormrod, 2010).

Correlations are assessed to test for issues of multicollinearity between individual measures of victimization and the two dummy measures of high polyvictimization. High polyvictimization (3+ types) has the highest correlations with psychological dating violence victimization (0.62) and very high polyvictimization (4+ types; 0.68). Very high polyvictimization is correlated with psychological dating violence at about 0.60. Variance inflation factors are calculated using the "estat vif" command in Stata after all models to test for multicollinearity problems. Across all delinquent outcomes, VIF scores do not exceed 3.5 for any of the independent victimization measures used in the regression models, indicating no issues of multicollinearity. As a result, it appears to be statistically acceptable to include all individual forms of victimization and the two measures of polyvictimization thresholds in the same models for each delinquent outcome.

Polyvictimization thresholds. Table 10 provides the regression coefficients for each of the individual victimization types plus the two dummy measures of high and very high polyvictimization. The models control for all variables used in the initial analyses including cell phone and computer activity, place and time most online, parental factor, demographic variables, expected grades, and anger. Standardized coefficients are presented for all models. Cyber dating violence (0.100; $p<.01$) and physical dating violence (0.090; $p<.01$) victimization both influence the risk of general delinquency, after accounting for polyvictimization. Being the victim of three or more types of victimization is associated with an additional increase in delinquency (0.100; $p<.01$), though 4+

victimization types is not significantly associated. This finding suggests that after a certain number of victimization experiences, there may be no additional effect associated with increased perpetration. For drug use, almost all victimization types are associated with an increased risk, though a negative relationship is found for psychological dating violence (-0.105; $p<.05$). Being the victim of 3+ victimization types is associated with an increased risk of drug use (0.420; $p<05$), but experiencing 4+ victimization types is not associated with an increase in the risk of drug use. High or very high polyvictimization does not appear to have any additive influence on bullying perpetration, though significant positive associations remain for bullying (0.248; $p<.01$), cyber bullying (0.109; $p<.01$), and physical dating violence (0.086; $p<.01$) victimization.

After accounting for measures of polyvictimization for physical dating violence, cyber bullying (0.062; $p<.01$), physical dating violence (0.497; $p<.01$), and psychological dating violence (0.141; $p<.01$) victimizations are all associated with an increase in the risk of perpetration. Experiencing 3+ types of victimization is associated with an increase of perpetration (0.036; $p<.01$), though 4+ victimization types is not significantly associated with physical DV. For psychological dating violence perpetration, both 3+ and 4+ victimization thresholds are significantly associated with an increase in perpetration. Specifically, 4+ victimizations doubles the risk of perpetration (0.113; $p<.01$), when compared the coefficient for 3+ victimizations (0.055; $p<.01$). Cyber bullying and physical dating violence are both associated with psychological DV perpetration (0.042 and 0.081; $p<.01$, respectively). A relatively large effect is found for the influence of psychological DV victimization on perpetration (0.462; $p<.01$).

Cyber outcome models demonstrate mixed results for Hypothesis 10. Though individual forms of victimization such as cyber bullying (0.376; $p<.01$), physical DV (0.118; $p<.01$), and psychological DV (0.058; $p<.01$) all are associated with an increase in the risk of cyber bullying, neither of the polyvictimization thresholds are associated with cyber bullying perpetration. Regarding online dating aggression, 4+ victimization types is associated with an increase in perpetration (0.039; $p<.01$), though 3+ victimization types is not. Cyber bullying (0.145; $p<.01$), cyber DV (0.403; $p<.01$), and physical DV (0.094; $p<.01$) are all significantly associated with an increase in online dating aggression perpetration.

Chapter Summary. While many types of individual victimizations are significantly associated with forms of delinquency both on- and offline, it appears that the number of types of victimization occurring across domains has an additional influence in many cases. The measure of victimization types is positively associated with all forms of delinquency, indicating that as individuals experience greater victimization on- and offline across different social domains, the risk of perpetration increases. The second analysis in this chapter lends partial support to the idea that polyvictimization is a unique strained experience that may have consequences for individuals above and beyond the experience of one kind of victimization or the additive effects of several kinds. For individual types of victimization, the type of victimization that corresponds with the perpetration type is always the most strongly associated. For example, the largest effects for in-person bullying perpetration are found for victims of bullying in person. This relationship holds for cyber bullying as well as all three types of dating violence.

The influence of polyvictimization may be especially consequential for the perpetration of dating violence across all three types measured – online, physical, and psychological. In other words, those who are victimized by peers and by dating partners, on- and offline, may be at the highest risk of engaging in dating violence themselves. This may be because dating partners are the closest and most "available" person to victimize. Young people may spend a substantial amount of their time with romantic partners and have increased opportunity for violence against those partners, compared to peers or others online. Young people may therefore paradoxically "hurt the ones they love most" by taking out their anger or frustration from being victimized by others.

In addition to dating violence outcomes, polyvictimization thresholds influence general delinquency and drug use. However, only the "high victimization" measure is significantly associated with each of the perpetration outcomes. These results, along with the results for physical DV, suggest a "saturation point" for victimization experiences where 3 types of victimization is associated with an increase in perpetration risk but 4 types do not have any additional effect. Experiencing multiple types of victimization appears to be overall deleterious for delinquent perpetration, but the unique effects of polyvictimization may cease to have an influence after a certain point.

VII - C. Results: Demographic Differences in Cyber Perpetration

Descriptive Results

The above results indicate significant associations between certain types of online activities, victimization, and perpetration outcomes, both on- and offline. Online activities on the computer include chat, email, using blogs and posting online, using

social media, and visiting websites with user-posted content. Online activities on cell phones include chat, email, visiting other websites, social media, and texting. Although the results control for important demographic characteristics including age, gender, and race, they do not provide insight into differences in online technology usage, experiences of victimization, or perpetration rates based on membership in groups according to these particular demographic categories. Though most of the major causes of delinquency have been shown to be similar across major sociodemographic groups (age, gender, race, SES, etc.), there has been little research examining differences in the effects of online behavior and cyber victimization across these groups. Given potential differences in these areas and their implications for understanding differences in risk, descriptive analyses are run across strata of each of these three key demographic categories.

Age Group. The first demographic analysis is conducted across two age groups based on the respondent's self-reported age and current grade. The mutually exclusive groups include: (1) Middle School (7^{th} & 8^{th} grade; ages 11-14); and (2) High School (10^{th} - 12^{th} grade; ages 15-18). The majority of the students were in high school (88%), followed by those in middle school (12%). Table 11 reports the descriptive results for key variables including both forms of online perpetration (cyber bullying and online dating aggression), computer activities, cell phone activities, time and location of online activity, parental restrictions, and victimization experiences. Two-tailed t-tests are used to test for significant compositional differences between the two groups for all descriptive results.

Table 11 about here.

Perpetration of both cyber bullying and online dating aggression increases as students get older. Cyber bullying perpetration increases from a mean of 0.12 in middle school respondents to 0.25 in high school respondents. The rate of online dating aggression more sharply increases from about .13 in middle school students to .40 in high school students. This trend of increase largely follows for all online activities as students get older, both on computers and cell phones. Compositional differences are significant for all activities except chatting both on computers and cell phones.

In general, students in high school report higher rates of going online in their bedroom and using the computer late at night. However, there are no significant compositional differences for using cell phones late at night, suggesting that it is relatively rare regardless of age group (M = .04 vs. .05). The results indicate a difference in parental monitoring of their children's websites. About 53% of middle school students report some kind of parental monitoring for websites visited, versus about 27% for high school students. This may suggest that parents feel that they need to monitor activity for younger children in 7th and 8th grade because they are young and cannot be trusted. It is likely that students in middle school are significantly more monitored by parents in general, compared to their high school counterparts. Parents may also believe that there is more exposure to online risks for young children, versus those who are in high school., necessitating a higher degree of monitoring.

Victimization rates vary substantially across the two age groups, where high school students report significantly higher rates of victimization across all five types (traditional bullying, cyber bullying, online dating aggression, psychological dating violence, and physical dating violence). Overall, the descriptive results indicate that there

are significant differences in perpetration, online activity, and victimization experiences, each increasing as the student moves from middle school into high school.

Gender. Table 12 provides the descriptive results separated by gender (adolescent girl/boy). Approximately 52% of the sample is girls and 48% is boys. While the rate of cyber bullying is higher for boys (M = 0.26), this difference is not significantly different. However, the rate of online dating aggression is significantly higher for girls (M = 0.42). Girls indicate significantly higher online activity on computers for all activities except visiting websites with user-generate content (boys M = 0.74; girls M = 0.60). Rates of online activity using a cell phone are similar between girls and boys, though girls use social networking sites on cell phones significantly more frequently than boys (girls M = 1.67 vs. boys M = 1.26) Similarly, girls indicate significantly higher rates of texting than men (girls M = 3.22 vs. 2.50). Girls report using their computer and cell phones more often in their bedroom compared to other places in the house (M = 0.42; M = 0.39, respectively). Rates of online activity late at night for both the computer and cell phones are relatively similar, as well as the rate of parental monitoring of websites by gender (boys = 0.29; girls = 0.31).

Table 12 about here.

Victimization rates both on- and offline vary by gender. Girls report higher rates of in-person bullying (2.84) and cyber bullying (0.58), as well as cyber aggression in dating relationships (M = 1.04). Notably, girls report substantially higher rates of psychological dating aggression than boys (M = 2.36 vs. 1.58). However, boys report higher rates of physical dating violence (0.84) than girls (0.60). All differences are

statistically significant. Thus, when it comes to cyber behaviors, boys report greater perpetration of cyber bullying and girls report greater victimization. Girls report greater rates of cyber dating aggression perpetration, but also higher rates of both cyber and psychological dating aggression victimization.

Race. Finally, descriptive results are presented in Table 13 for differences between White and Black students. The majority of the sample is White (78%), and only about 7% of the sample identifies as Black or African American. The remaining 15% of the survey sample is comprised of self-identified Hispanic, Asian, Native American, and Mixed Race respondents and were not included in the stratified analyses.

Table 13 about here.

Cyber bullying and online dating aggression is highest among Black respondents (M = 0.34; 0.64), though only online dating aggression is statistically higher than perpetration by White respondents. In regards to online activities using computers, Black respondents have the highest rate of instant messaging and use of chat applications on the computer (M = 1.16) and using social networking sites (M = 1.61, vs. 1.29 for White respondents). White respondents report lower rates of online activities on computers and a similar trend is found for online activities using cell phones, where White respondents report significantly lower rates of usage compared to Black respondents for all activities except texting. Using social networking sites and texting are the most highly reported activities across both racial groups – Black students report mean usage of 2.06 for social networking sites and mean texting of 3.01.

Black students are more likely to use computers and cell phones late at night, compared to their White counterparts (M = 0.12 and 0.11 vs. 0.08 and 0.04. There are also significant reporting differences for all types of dating violence victimization between White and Black respondents. In particular, Black respondents report higher rates of cyber dating aggression victimization (M = 1.40) compared to their White (M = 0.91). Black respondents report much higher psychological dating violence victimization than their White counterparts (M = 2.68 vs. 1.91 in White respondents). Physical dating aggression victimization is also reported highest among Black students (M = 1.23), compared to their White counterparts (0.66). In sum, Black students report the highest rates of both online perpetration and victimization (in-person and online). Black students also report higher overall rates of online activity and the use of online devices late at night.

Summary. Overall, the descriptive results suggest that high school students have higher rates of perpetration and victimization, as well as generally higher online activity across computers and cell phones. Girls report higher online dating aggression perpetration and higher computer activity. Differences vary across gender for cell phone activities and where/when students go online the most, though girls have higher rates of all forms of victimization except physical dating aggression. Black students have higher rates of perpetration, most forms of victimization, and higher online activity across cell phones and computers. While these compositional differences may account for differences in the effects of technological and victimization factors on cyber perpetration, the following multivariate results test for significant differences in the actual effects across groups.

Multivariate Results – Cyber Delinquency

Age Groups. Table 14 reports the multivariate regression results for the age-stratified models, regressing both cyber bullying and online dating aggression perpetration on all variables. Standardized coefficients are reported here for ease of interpretation. Overall, the majority of the measures related to online activity do not have a significant relationship perpetration across either of the two age groups. There are no major trends of online activity that increase perpetration across groups. However, there are certain isolated activities that increase the risk of perpetration depending on the respondent's age group membership. Likelihood ratio tests are used to determine whether or not significant differences exist between coefficients across the two subgroups when the effects are significantly associated with the outcomes within the respective subgroup models.

Table 14 about here.

Using blogs or posting online using a computer is significantly associated with online dating aggression for high school students (0.028; $p<.05$) but not those in middle school. Reading or doing research on the computer is negatively associated with both cyber bullying (-0.047; $p<.05$) and online dating aggression (-0.053; $p<.05$) for high school students only. No other computer activities were associated with online perpetration across either group. For cell phones, the use of chat applications is negatively associated with online dating aggression for high school students (-0.044; $p<.01$). For those using email on cell phones, the activity is negatively associated with online dating aggression for middle school students only (-0.108), while it is positively

associated with cyber bullying for high school students (0.046; $p<.01$). No other cell phone activities are associated with an increase in perpetration of either form of online delinquency. There are no significant associations between perpetration and the location or time most used for cell phones or computers across age groups. However, a negative relationship is found between parental monitoring of websites for high school students and cyber bullying (-0.030; $p<.05$).

Regarding the different forms of victimization, in-person bullying is associated with a decrease in online dating aggression for high school students only (-0.036). Cyber bullying is significantly associated with an increase in both forms of online delinquency across both middle school and high school students. However, likelihood ratio tests demonstrate no significant differences in the effects across the student age groups. Similarly, cyber dating violence is associated with a increase of online dating aggression perpetration across both age groups, though it is only associated with cyber bullying for middle school students (0.188; $p<.01$). No significant differences in the effects of cyber dating violence on online dating aggression are found between the student age groups. Interesting, psychological dating violence is negatively associated with both forms of perpetration for middle school students (-0.209 and -0.307, respectively; $p<.01$). However, it is not associated with perpetration for high school students. Finally, physical dating violence is associated with an increase in perpetration for all students, though no significant age group differences were found for the effects of this victimization on perpetration. Finally, girls are less likely to perpetrate cyber bullying (-0.067; $p<.01$) and Black high school students are more likely to perpetrate online dating aggression (0.031;

$p<.01$). Anger is significantly associated with all forms of online delinquency, though no statistically significant differences were found across age groups.

While some isolated online activities are found to be slightly associated with the two forms of perpetration differently across age groups (blogs and posting online, research) as well as online activities on a cell phone (using chat applications), the experience of victimization appears to be the most consequential for online perpetration across the two age groups. In particular, cyber bullying and physical dating violence victimization are both associated with an increase in the risk of perpetration across both age groups, though there is no statistical difference in their effects on perpetration across the groups.

Gender. Table 15 provides the multivariate results stratified by gender. Regarding online activities using a computer, blogging and posting online is positively associated with online dating aggression (0.058; $p<.01$) for boys, but not girls. Researching online using a computer is negatively associated with online dating aggression perpetration for boys, but not cyber bullying perpetration. Conversely, researching is significantly associated with a decrease in perpetration across both cyber bullying (-0.069; $p<.01$) and online dating aggression (-0.077; $p<.01$) perpetration for girls. No other online activities using the computer are associated with any form of online perpetration. Online activities using cell phones are largely inconsequential for online perpetration, save for using chat applications among boys, which is negatively associated with chat application use (-0.053; $p<.01$). No other cell phone activities are associated with perpetration across the gender-stratified models.

Table 15 about here.

While the use of a computer most in one's bedroom is not associated with online perpetration, the use of a cell phone most in one's bedroom is positively associated with both cyber bullying (0.039; $p<.01$) and online dating aggression (0.040; $p<.05$) among girls only. This suggests that girls may be more likely to engage in online perpetration with mobile devices if they are in their bedrooms and out of the purview of their parent's supervision. Though no effects are found for using a computer most late at night, boys who use their cell phones most late at night are significantly more likely to perpetrate online dating aggression. No effects are found for girls using their cell phones most often late at night. Parental restriction of websites visited is associated with a decrease in cyber bullying (-0.053; $p<.01$) for boys only. No effects are found for the relationship between parental restriction and online perpetration for girls.

Certain differential effects of victimization experiences are found across the gender-stratified models. Though cyber bullying victimization is significantly associated with an increase in online perpetration across both boys and girls, the largest effects are found for cyber bullying perpetration rather than online dating aggression. In particular, cyber bullying victimization is shown to have a larger influence on cyber bullying perpetration for girls (0.401; $p<.01$) than boys (0.377; $p<.01$). Conversely, cyber bullying victimization has a larger influence on online dating aggression perpetration for boys (0.246; $p<.01$) than girls (0.120; $p<.01$). The differences in the effects of cyber bullying on both forms of online perpetration are statistically significant. Cyber dating aggression victimization is associated with cyber dating aggression perpetration among both girls and boys, though these effect differences are not statistically significant. Divergent directional differences are found for the experience of psychological dating violence

across the two gender groups. Psychological dating violence victimization is negatively associated with online dating aggression perpetration for boys (-0.070; $p<.01$), whereas it is positively associated with online dating aggression perpetration for girls (0.089; $p<.01$). Finally, physical dating violence victimization is consequential for both forms of online perpetration across boys and girls (range: 0.074 to 0.108; $p<.01$). However, there is no statistically significant difference in the effect on perpetration for either psychological or physical dating violence victimization, suggesting that the differences are compositional in nature.

Age is associated with an increase in online dating aggression, but only for girls (0.055), suggesting that high school girls are the most at risk for online dating aggression perpetration, compared to boys. Similarly, being a Black girl is associated with an increase in online dating aggression (0.052; $p<.01$), though no other differences in racial groups are found across the two gender-stratified models for perpetration outcomes. While expected grades are not associated with an increase in perpetration across either gender group, anger is associated with greater perpetration of both outcomes across genders. Anger appears to be more consequential for cyber bullying perpetration than online dating aggression, and this pattern maintains for both gender groups. Gender differences are found regarding the influence of parental closeness. While boys closer to their parents are significantly less likely to engage in cyber bullying (-0.041; $p<.01$), girls that are close to their parents are significantly more likely to perpetrate online dating aggression (0.042; $p<.01$). Parental education is not significantly associated with any form of online perpetration.

Race. The final multivariate results for the race-stratified models are presented in Table 16. Overall, few isolated effects are found between the relationship of certain online activities and online perpetration across White and Black racial groups. Using email on the computer is associated with an increase in cyber bullying for Black (0.133; $p<.01$) respondents, though no effects are found for their White counterparts. However, email using a computer is not associated with online dating aggression for these respondents. Blogging and posting content online is significantly associated with an increase in online dating aggression perpetration for Black respondents (0.118; $p<.01$), though no effects are found for their White counterparts. Time spent researching using the computer is associated with a decrease in both cyber bullying (-0.061; $p<.01$) and online dating aggression (-0.050; $p<.01$) for White respondents only. Social media use and visiting websites with user-generated content are not associated with either form of online perpetration across either of the racial groups.

Table 16 about here.

Only two online activities using a cell phone are associated with any form of perpetration across the two racial groups. For Black respondents, using chat applications on a cell phone is associated with a decrease in online dating aggression (-0.141; $p<.01$) but not cyber bullying. Using email on a cell phone is associated with an increase in cyber bullying for White respondents (0.041; $p<.01$), but not online dating aggression. Email is shown to have no association with online perpetration for White students using the computer, suggesting that the activity on a cell phone may be more problematic for bullying than on a computer. No other online activities using a cell phone are shown to be

associated with online perpetration across the racial groups. Similarly, none of the variables measuring time and place most used for cell phones and computers are shown to be significantly related to online perpetration for White or Black students. Parental restriction for website access is negatively associated with cyber bullying for White respondents (-0.032; $p<.01$), though no relationship is found for online dating aggression or any form of perpetration among their Black counterparts.

More so than the age- or gender-stratified models, there appears to be differences in the effect of different forms of victimization across racial groups. In-person bullying is associated with a decrease in online dating aggression for White students (-0.041; $p<.01$). Like many of the other stratified models, cyber bullying victimization is significantly associated with an increase in online perpetration of cyber bullying across both racial groups, though there is no statistically significant difference in the effects on perpetration. Cyber bullying victimization is also associated with an increase in online dating aggression for White (0.192; $p<.01$) and Black (0.272; $p<.01$) respondents, though effect sizes are not statistically different. Cyber dating violence victimization is associated with an increase in online dating aggression perpetration for White (0.398; $p<.01$) and Black (0.374; $p<.01$) respondents, but not cyber bullying perpetration for either racial group. However, the effect sizes are not significantly different across the racial groups. Finally, physical dating violence victimization is associated with an increase in both forms of online perpetration for White and Black respondents, though no significant differences are found in the effect sizes.

Certain demographic factors across the race-stratified models are associated with online perpetration. White (-0.041; $p<.01$) girls are less likely to perpetrate cyber

bullying, though no similar effects were found for Black girls. Older White respondents are significantly more likely to commit online dating aggression (0.028; $p<.01$), though no age effects were found for Black respondents across either form of online perpetration. Higher expected grades are significantly associated with a decrease in cyber bullying for White students (-0.048; $p<.01$) and online dating aggression for Black students (-0.088; $p<.01$). While anger is associated with an increase in both cyber bullying (0.069; $p<.01$) and online dating aggression (0.056; $p<.01$) in White students, it is not associated with perpetration for Black students. Parental closeness is associated with an increase in online dating aggression among White students only (0.033; $p<.01$). Parental education is not associated with either form of perpetration among either of the racial groups examined.

The results suggest that there are few differences between racial groups in how online activities across computer and mobile devices influence cyber perpetration. Similarly, no significant differences are found in effects sizes for any of the victimization experiences associated with perpetration across racial groups. Like the age- and gender-stratified models, the isolated effects found across racial groups tend to be small, even when significantly associated.

Chapter Summary. Overall, the results of this chapter indicate certain isolated differences in the relationship between online activities and different forms of delinquency across demographic groups. Some of the largest differences across age, gender, and racial groups tend to be around the magnitude of victimization influences, where certain groups appear to have a greater burden of victimization as it relates to delinquency and aggression than others. Though differences appear to be largely compositional (descriptive differences in levels of the independent variables, rather than

significant differences in effects on outcome variables), the magnitude of cyber bullying victimization differs in effect significantly across gender lines. The following Discussion section synthesizes the three results chapters, with the aim of identifying the most consequential areas related to online activity, victimization, and delinquency in-person and online. Particular attention is paid to how online factors relate to in-person outcomes, and vice versa, suggesting certain ways that delinquency may permeate across both digital and offline spheres of adolescent life. The role of victimization across social domains and polyvictimization as a significant potential risk factor for delinquency is also discussed.

VIII. Discussion

This dissertation was developed to understand better how time spent online might influence delinquency. As young people spend an increasing amount of time online via computers and mobile devices, it is important to consider the negative consequences of online activity alongside its many benefits. Across the three results chapters, a central goal of this thesis was to examine how time spent on certain online activities influences different forms of delinquency both on- and offline. Much of the existing research on cyber behavior tends to examine conduct online separately from conduct in person. This false separation of social domains among young people is problematic given that behavior online likely influences behavior in person, and vice-versa. This kind of reciprocal influence will matter more as online technology becomes more deeply integrated into people's daily lives through the Internet of Things (IoT), artificial intelligence, voice-driven user interfaces, and new forms of social media. As digital and

"real" worlds converge, an integrated framework that accounts for a technological explanation of crime using key criminological theories will be crucial in keeping up with how delinquent and criminal behavior is changing in the face of technological progress.

This project set out to examine the following three questions: A) Are specific online activities associated with an increase or decrease in delinquent behaviors, on- and offline? B) Is victimization at the hands of peers, in multiple forms, and across online and in-person domains, associated with delinquency on- and offline? and, C) Are there differences across age, race, and gender groups in the influence of online activity and victimization on delinquency, on- and offline? A broad theoretical framework was laid out, focusing on peer associations and social learning processes, experiences of strain, social control, and how time is spent online on a day-to-day basis. Though many of the theoretical hypotheses laid out could not be tested using the current data, thirteen analytic hypotheses were proposed. Overall, the results yielded mixed results for the hypotheses, with the strongest support for Hypotheses 5-10 related to victimization and polyvictimization.

Online Activities: Hypothesis 1-2. The first results chapter (7A) examined the influence of online activities across different forms of delinquency on- and offline. After accounting for all controls and victimization measures, there was some support across all forms of delinquency for Hypothesis 1, which predicted that online activities such as texting, social media, browsing websites, and chatting would be associated with an increase in delinquency. Although certain activities like using social media on the computer were associated with in-person forms of delinquency like bullying and physical dating violence, the effects were generally small. It was argued that social media would

expose young people to delinquent peers, upsetting content, or increased opportunity for communication with peers and dating partners that can lead to in-person abuse. Unfortunately, it was not possible to directly measure whether social media use had these effects in this study. While the results suggest that online activity may have certain offline consequences, the influence is likely small. No online activities on the computer were significantly associated with either form of online perpetration after accounting for all other factors in the fully specified models.

Time spent reading and researching on the computer was associated with a decrease in all forms of delinquency, both on- and offline. These results suggest partial support for Hypothesis 2, which predicted that online activities including researching and emailing would be associated with a decrease in the likelihood of delinquency. Young people may be invested in school, going online mainly to research and study with less time available for delinquent activity. Those same young people may also be less likely to engage with delinquent peers or be exposed to forms of victimization online that could lead to delinquency. The size of the effects for research online were also relatively small, indicating that time spent researching online is likely to play a limited role in reducing delinquent behavior. Using email on computers or cell phones was not associated with a decrease in any form of in-person delinquency, though it was associated with a small increase in cyber bullying. This was contrary to the expectations of Hypothesis 2, suggesting that email may not be associated with a decrease in the exposure to risk of perpetration in the ways expected.

Certain cell phone activities had a small influence on particular forms of delinquency. Interestingly, the use of chat applications was negatively associated with

both psychological and online dating aggression, contrary to the expectations of Hypothesis 1. Chat applications may be more public than text messages, especially if they are used via Facebook or as platforms for group chats (such as the application WhatsApp or GroupMe). Participation in public or group chats may decrease the likelihood of dating partner abuse because young people are unwilling to abuse a partner in front of others either online or in-person. Individuals in dating partnerships, especially those who are younger, are likely heavily influenced by their peers and unwilling to act in a way that would upset their friends or hurt their own reputation. Texting using cell phones is positively associated with psychological dating violence (but not online aggression), suggesting that frequent direct and personal contact with a dating partner may serve to exacerbate abuse while chatting with monitoring from others may temper it. Future research should assess the actual content of chats and text messages between dating partners to better understand how these communication dynamics might change across platforms.

Total Time Online: Hypothesis 3-4. Although some isolated effects were found for the influence of particular online activities on delinquency, models were also assessed to examine the influence of total time spent online. Hypothesis 3 predicted that greater time online using computers would be associated with an increase in delinquency while Hypothesis 4 predicted the same for online activity using cell phones. Mixed support was found for Hypothesis 3 while Hypothesis 4 was generally not supported. The results for the models testing computer and cell phone time online separately suggest that the amount of time spent online only influences certain in-person forms of delinquency and is not associated with either form of online delinquency. Although the total amount of

time spent on cell phones was positively associated with types of delinquency like drug use and bullying, total time spent on the computer was negatively associated with general delinquency, drug use, and psychological dating violence. This may be because a computer is located in the individual's home or at school, creating less opportunity for delinquency. On the other hand, cell phones are more mobile by nature and their use might take place anywhere to facilitate drug use or bullying behaviors in person.

Those using the computer a lot may be using it more in school, supervised in the home, or for school work, but without an understanding of the actual activities taking place, it is hard to know why the direction of effects are different across the two media. In a subsequent test, the total time spent across both devices was only associated with an increase in in-person bullying. The different directional influences on delinquency of time spent online for computers (negative) versus cell phones (positive) likely means that an overall measure of time online does not capture a detailed enough measurement to test influence on delinquency. Overall, the results suggest that online activity's relationship to delinquency is complex: it depends on the actual activity, the device used to go online, and the form of delinquency in question. Analyses that aggregate measures of total time spent in association with broad scales of delinquency are likely oversimplifying the nature of the relationship.

Victimization: Hypothesis 5-9. Support was generally found for Hypotheses 5-9. Each hypothesis predicted that a form of victimization would be associated with an increase in the likelihood of all forms of delinquency including cyber bullying (#5), online dating aggression (#6), in-person bullying (#7), physical dating violence (#8), and psychological dating violence (#9). The results suggest that victimization is a significant

strain not only for in-person delinquency, but also delinquency online. The experience of a given type of victimization only was associated with an increased risk for that same kind of perpetration in the case of in-person bullying. In other words, being the victim of in-person bullying is only associated with perpetration of in-person bullying. In all other cases, one kind of victimization was associated with increased perpetration of multiple types and often across both on- and offline domains. Cyber bullying victimization was associated with all forms of perpetration except general delinquency, while cyber dating violence victimization was associated with an increased risk for general delinquency, drug use, and cyber dating violence perpetration. Psychological dating violence victimization was positively associated with multiple forms of perpetration, though it was negatively associated with drug use. This suggests that those psychologically victimized by dating partners may not turn to drugs as a means of coping, but rather other outward forms of delinquent behavior to deal with the victimization that has a specific target like bullying or dating violence. Physical dating violence was positively associated with all forms of delinquency and had some of the largest effects across all models, suggesting that being a victim of violent physical abuse might be a major predictor not only for in-person delinquent behavior, but also for delinquency that takes place online. This lends support to the notion that real world behaviors may have significant online consequences, and vice versa.

It is not surprising that these forms of victimization have a substantial influence on delinquency both in person and online. According to Agnew (2001), the most significant forms of strain are high in magnitude and viewed as unjust by the person being strained. The experience of being victimized is hard to ignore, difficult to cope

with, and creates an incentive for delinquent behavior, namely getting revenge on the person who is responsible for the victimization or taking out one's anger on another person (especially in the case of bullying or dating abuse). Strain that results from victimization, whether it takes place online or in the "real world," is likely to stick with a person as they move throughout their lives and interact with people across social domains. Therefore, just because a person is the victim of cyber bullying or dating abuse online, doesn't mean that the negative emotions from that victimization will not carry over into the real world and lead to physical forms of perpetration. Though the measures in the data are imperfect and do not enable a full test of all theories presented here, the data available suggest that victimization strain plays an important role in delinquent behavior that spans both digital and physical domains.

Polyvictimization: Hypothesis 10. Chapter 7B sought to examine the unique influence of experiencing multiple forms of peer victimization both in-person and online. Rather than look at the number of times an individual was victimized (frequency), or the variety of victimization experiences within a certain type (e.g. victimization experiences of physical dating violence; cyber bullying, as done in Chapter 7A), the first analysis related to polyvictimization assessed the number of types of victimization experienced over the past year. The results suggest general support for Hypothesis 10, which predicted that polyvictimization would be associated with an increase in the likelihood of all forms of delinquency after accounting for individual victimization experiences. The subsequent analysis in Chapter 7B demonstrated that particularly serious forms of polyvictimization (3+ or 4+ types) were associated with all delinquent outcomes except bullying and cyber bullying, even after accounting for individual victimization

experiences. This was especially salient for all three forms of dating abuse (physical, psychological, and cyber). The results suggest that polyvictimization is a kind of victimization experience in and of itself that may account for some of the consequences of individual victimizations traditionally discussed in victimization literature.

The approach used here to assess the unique influence of polyvictimization was informed by prior work on polyvictimization, which shows that victimizations taking place across different spheres of social life for young people can lead to the person feeling like they are "trapped" or cannot get away from feeling like a victim throughout the course of their day (Finkelhor, Ormrod, and Turner, 2007). For example, physical dating violence may include being slapped, kicked, punched, or pushed by a dating partner. While all of these actions are considered instances of physical dating violence, they happen at the hands of one person in a single relationship. If an individual is being repeatedly physically abused by a dating partner or abused in different ways by that person, the individual may still have other relationships or areas of their social life where they can feel safe (e.g. with their peer group, in the home, online with friends). However, if that same individual is being abused by a romantic partner while also experiencing bullying in school in person or online by peers, the person might feel like they cannot escape the feeling of victimization. Given this, research and the results presented here suggest that there may be an additional negative effect of polyvictimization beyond the sum of the frequency or variety of victimization instances.

A major gap in research revealed in this study is the lack of attention that has been given to teen dating violence. While a substantial body of literature examines intimate partner violence (IPV) and violence against women (VAW), there is reason to believe

that violence between dating partners among adolescents is different than violence that takes place between adults in key ways. However, the dynamics of this kind of aggression as well as the risk and protective factors are still poorly understood. The results related to victimization and polyvictimization suggest that being a victim of peer abuse, on- and offline, may be particularly consequential for abuse against a dating partner. Polyvictimization may represent a sort of compounded strain where individuals are not able to get away from the feeling of being a victim. This may result in negative emotions like anger and frustration, which are then taken out on the closest person to them. Adolescents may be at particular risk for the consequences of polyvictimization on dating aggression because they are inexperienced in romantic relationships and lack the proper coping mechanisms to handle victimization experiences prosocially. Adolescents also may place a tremendous amount of emotional and psychological pressure on dating relationships, which can lead to heightened emotions and risk of abuse when something goes wrong in- or outside of the relationship. The unique characteristics of adolescent relationships and the relatively equal power dynamic between males and females in relationships (since the girls are typically not dependent on the boys at this stage in their lives) may help to explain why boys and girls offend at similar rates, compared to their adult counterparts where women are overwhelmingly the victims of intimate partner abuse.

The distinctive nature of teen dating relationships suggests, with support from the results regarding victimization and polyvictimization presented here, that dating aggression among young people may be more reciprocal than dating violence among adults. Boys and girls may be aggressive towards one another in a relationship more often

than those in an adult relationship, where the woman may have less power to retaliate or strike back (physically or emotionally). The substantial amount of time spent online for young people may contribute to more opportunity for this kind of reciprocal behavior, especially if young dating partners are experiencing problems in a relationship and are in constant communication online. While it is no longer the case that only young people are in constant touch with one another in person and online during romantic relationships, they may place excessive emotional emphasis on the interactions that take place online and lack the coping resources to handle things when difficulty arises.

Time, Place, and Parental Factors: Hypothesis 11-14. Hypothesis 11 predicted that parental monitoring would be associated with a decrease in the likelihood of all forms of delinquency. Respondents who claimed that their parents directly monitored their website activity in some way were generally shown to have lower delinquency in person and online (though not for online dating aggression). The effects were small but generally lend support to Hypothesis 11. This suggests that parents who use some kind of Internet monitoring software (such as NetNanny) or inquire about the sites visited with their children can influence their children's own delinquent behavior. While monitoring online activity may be indicative of general monitoring for all behavior across in-person and online domains, it is possible that online monitoring can influence children's cyber behavior, which in turn influences in-person behaviors. In other words, parental monitoring online may have a spillover effect on in-person behaviors. Although it is difficult to disaggregate the influence of parental monitoring on online versus in-person behaviors because there is no measure of in-person monitoring here, future research

should aim to include both measures to properly assess the influence of parental supervision across digital and real world domains for their children's delinquency.

The use of computers and cell phones late at night and in the bedroom was largely not related to delinquency, lending generally little support for Hypotheses 13 and 14. Hypothesis 13 predicted increased delinquency associated with those who use cell phones and computers predominantly in the bedroom, while Hypothesis 14 predicted increased delinquency associated with those who use cell phones and computers most often late at night. The use of a computer late at night had a small association with general delinquency and drug use, and the use of a cell phone late at night had a small association with psychological dating violence. It is possible that young people using computers and cell phones late at night without parental supervision may go online and engage in activities that facilitate in-person behaviors like drug use, in-person delinquency, and psychological dating violence. On the other hand, those who are online late at night may simply have less parental supervision and be more available to engage in delinquency in general. Models that include parental supervision measures for online and in-person behavior will be best equipped in future research to tease out the influence of online activity at certain times and in certain places.

Group Differences in Activity and Victimization. The final set of analyses was exploratory in nature, seeking to examine differences in the influence of online activities and victimization experiences for young people by age group, racial group, and gender. Descriptively, high schools students reported significantly higher online activity, perpetration, and victimization than middle school students. Girls reported higher computer activity, online dating aggress perpetration, and almost all forms of

victimization than boys. Finally, Black students reported higher online activity, online perpetration, and most forms of victimization, compared to their White counterparts. These compositional differences appear to account for most of the differences in effects found across groups for the influence of online activity and victimization on forms of delinquency. For example, cyber bullying victimization and physical dating violence victimization were significantly associated with both forms of online delinquency for both middle school and high school students. However, no significant differences were found in the magnitude of effects across these groups, suggesting that any difference is likely attributed to differences in the level of baseline victimization experienced in each group. A similar relationship was found for Black and White students across these forms of victimization. No significant differences were found, suggesting that there is no additive effect of race on the relationship between these forms of victimization and delinquency.

One finding that does suggest the need for future research relates to the influence of cyber bullying victimization on online delinquency by gender. Cyber bullying victimization is positively associated with both cyber bullying perpetration and online dating aggression, though the magnitude of the effects differs significantly across gender. Cyber bullying victimization has a larger influence on cyber bullying perpetration for girls than boys, suggesting that girls who are cyber bullying victims may be more likely to perpetrate cyber bullying than boys. However, cyber bullying victimization has a significantly larger association (about double) on online dating aggression perpetration for boys than girls. This suggests that boys who are bullied online may be more likely to turn around and be abusive online to a dating partner than girls. This is striking given that

girls report higher rates of cyber bullying victimization, yet boys appear to be more affected by it as it relates to dating aggression online. This is further corroborated by the marginal effects depicted in Figure 4, which shows that very high polyvictimization (4+ victimization types) substantially widens the gender gap for perpetration of dating violence online. Up until the experience of four or more types of polyvictimization, rates of dating violence online remain very similar between boys and girls.

It appears that girls who are bullied online are at higher risk for turning around and bullying others, while boys who are bullied online are at higher risk for taking that out on a romantic partner. While lending some support to the theory that victimization in one social sphere can influence perpetration in another, these initial results suggest a further need to study the dynamics of dating aggression and the victimization strains that can lead to aggression between partners. Though dating aggression may be more reciprocal among young people than adults, it is still crucial to consider gender differences in victimization experiences and different factors that may lead to abusing a partner.

Summary. Overall, specific online activities have isolated influences on different forms of delinquency. Since the findings were sometimes contrary to the arguments and hypotheses presented, there may be reasons for the lack of effects or small effect sizes found. One possible explanation is that the measures of time spent on each online activity do not account for the specific content and nature of the activity itself. That is, if a lot of time is spent on social media or texting, but this time is spent on prosocial interactions and having positive experiences, the activity is not likely to be associated with delinquency or aggression online. The available data do not include information on the

actual content or interactions that take place online, making it difficult to get into the level of detail required beyond time spent on each activity. As a result, many of the arguments related to time online for this project may still pertain to delinquency, but may require more detailed measures of online activity to provide empirical support. It is also possible that online activity is simply not very influential on in-person and cyber delinquency. Given the growing body of research that suggests that online activity is associated in certain ways with delinquency, however, it is more likely that the lack of findings here points to a measurement issue.

The results do show that victimization experiences and the unique experience of polyvictimization in-person and online are far more consequential for increasing delinquency in than how they spend their time on the Internet. There are few significant gender, age, and racial differences in the effects of online activity on delinquency, though cyber bullying victimization appears to affect boys and girls differently. Teenage dating violence continues to be an understudied area of research, especially as it relates to adolescent relationships that take place in-person and online. The following section discusses the limitations of this study and proposes ideas for future research related to online activity, cyber victimization and perpetration, and teenage dating violence.

IX. Limitations, Future Research, and Policy Implications

There are certain limitations associated with the current research. The data are cross-sectional in nature, making it difficult to make causal claims about the relationship between online activity and delinquency. While the theories invoked here suggest that certain online activities can lead to delinquent behaviors, it is also possible that

delinquency increases the amount of time spent on particular activities. For example, those that use drugs may spend more time online researching different drugs and how to obtain them, or getting in contact with peers that can provide more drugs. While being online and using social media sites may create more opportunity for cyber delinquency and abuse of a dating partner online, those that are already engaged in cyber delinquency may be more inclined to go online and perpetuate that abuse than those who are not delinquent online. Like many relationships for crime found in the criminological literature, those between online activities and crime may be reciprocal, where online activity increases the risk for delinquency and delinquency increases online activity.

To assess the temporality criterion for causality, longitudinal data are needed to examine first online activity and then delinquency, both on- and offline, at a later point in time. While a large number of longitudinal surveys currently exist assessing criminal participation and delinquent behavior, these data rarely include detailed questions about online behavior. Future research should include similar granular measures of the amount of time spent on different online activities alongside updated measures of in-person and cyber delinquency. However, qualitative research is needed to test some of the assumptions in the theories used here. While the amount of time spent on particular activities and the types of websites/applications used may shed some light onto whether these activities lead to crime, the mechanism fueling the relationship cannot be understood without content analysis of the online activities and communication across online platforms.

One way to better understand the content of activities involves monitoring online activity for young people, using applications like Watchover and Nischint with

consenting juveniles to look at the content of websites visited, apps used, and communication with others (e.g. texts, emails, chats). These monitoring applications can track full activity across a mobile device, enabling researchers to get a much clearer picture of how young people are spending their days online. Nischint, in particular, includes SMS and phone logs as well as full insight into applications downloaded and geolocation tracking. A study that utilizes these applications will have the ability not only to track activity from a quantitative perspective (number of minutes, hours, and days spent on particular activities), but also enable full qualitative analysis of day-to-day activity. This kind of application tracking can be done over the course of a number of months, alongside interviews and surveys with the participants to examine delinquency and cyber aggression at different points in time. Ideally, the study would be carried out across a representative sample of adolescents across the country to enable generalizable results in the United States.

Research examining the content of message boards and public online forums like Reddit and 4chan, as well as "dark web" sites specifically used to facilitate criminal activity can also be helpful for understanding how online activity may manifest into real-world delinquency. These forums often include detailed conversations that enable anybody to look into how to commit a crime, obtain illegal goods, or engage in illegal activities (e.g. prostitution, gambling). Studies should also consider interviews and focus groups with young people who are online and engaged in delinquent behavior – especially those that are engaged in teen dating violence. This qualitative research will enable a more robust test of social learning and strain perspectives on crime that may be useful in decreasing delinquency related to online activity in the future.

The data used here are not nationally representative since the survey draws from ten schools in three states in the U.S. using a convenience sampling strategy. In addition to not being representative of the entire country, the data are heavily skewed towards responses from White students. Future studies therefore not only need to consider the use of longitudinal data, but also representative data of the entire United States to assess the relationships here. Notably, the data were collected in 2011 and 2012 and do not represent all new technologies currently used by adolescents (such as Snapchat or Instagram) while also including technologies no longer used frequently or at all (such as MySpace). Future surveys looking to track online activity among adolescents should also consider how online behavior has changed in the past 6 years. Advances in video technology and the increasing popularity of platforms such as Facebook Live and YouTube encourage a much greater emphasis on video communication. As mobile technology continues to proliferate, young people are communicating with one another and recording content that is then posted on social media and shared amongst peers. While the data here acknowledge some forms of video technology, posting private explicit videos without permission has increased as a new form of cyber bullying and dating aggression called "revenge porn." New forms of cyber abuse that further blur online and real worlds continue to proliferate including "trolling," "flaming," "doxing," and "swatting," evolving as new forms of technology emerge with potential real-world consequences (Li, 2018). Surveys designed to examine online delinquency should account for these new crimes and others that emerge to create an updated depiction of cyber crime amongst young people.

In spite of these limitations, the dataset includes detailed measures of cyber delinquency, virtual activities, psychosocial characteristics, and control variables. The data are well organized by the initial surveyors, reliable and have not been used previously by criminologists to test the relationships of interest. The results of this research can hopefully encourage updated data collection of a longitudinal and nationally representative sample with new measures of cyber delinquency. It is especially important to collect more detailed data that can be used to understand the dynamics of teen dating aggression, both in-person and online, alongside continued analysis of cyber bullying.

Missing Measures and Controls

There are certain limitations regarding the measures available in the survey. While there are many useful dependent measures related to delinquency available, the in-person general delinquency measures in the survey lacks a specific measurement of theft. Although there is a measure of attempting to steal a vehicle, there is no assessment of stealing property more or less than $50 or any measurement of shoplifting, two common variables used in research on juvenile delinquent behavior. There is also no available measure of robbery. Thus, the in-person delinquency measure used in the analysis is skewed towards school-related delinquencies like getting suspended, taking a handgun to school, or having been drunk at school. Nevertheless, the measures used offer a good approximation of offline delinquency that can be analyzed alongside other forms of cyber violence and drug use in the future.

There are certain independent variables unavailable in the current dataset. There is no measure of self-control, a significant predictor of delinquent perpetration and dating violence and victimization (Finkel, DeWall, Slotter, Oaten, and Foshee 2009; Gottfredson

and Hirschi 1990; Sellers 1999). Self-control may be particularly salient for online delinquency since cyber abuse of peers and dating partners can take place quickly and anonymously. Those with lower self-control may be more prone to delinquency and abuse online than offline given the relatively immediate and anonymous nature of offenses online. There are also no measures of delinquent peer association or peer activity of any kind. This lack of measurement makes it difficult to specifically test theories of social learning, especially considering that young people may be increasingly influenced by their friends online rather than in person. While a named network analysis that examines how respondents are associated with other individuals taking the survey would be optimal in measuring delinquent peer association, respondent estimations of their peers' behaviors online would also be helpful in testing social learning theories. In addition, there is no explicit variable that measures household income or any kind of earnings. While the survey does measure the SES of the school where the respondent was interviewed based on the percentage of students receiving free or reduced lunch, this data was masked to protect respondent confidentiality and is not publically available.

Online activity and victimization experiences may also differ depending on school-level environmental factors such as school SES, intervention efforts for victimization and delinquency, and policies related to prevention of aggression on school grounds. Thus, future research on adolescents related to technology use and delinquency should consider a multi-level approach that not only accounts for individual factors but also environmental heterogeneity at the school level. The current data do not include clustering information or school-level variables, though it is possible that the Urban Institute may have this data available for private research. School factors may influence

students' access to technology and educational efforts designed to prevent violence, which may mitigate or moderate some of the results found here at solely the individual level.

Although specific types of victimization and polyvictimization are shown in these analyses to be particularly influential for delinquency both on- and offline, they only represent victimization at the hands of peers. No measures of victimization in the home by family members or criminal victimization were included in the survey, making it possible that other forms of victimization are more consequential than those committed by peers. However, given the population of young people sampled here, it is likely that the opinions and actions of peers mean a great deal and may be particularly salient as a source of major strain. Longitudinal data would be needed for a proper test of General Strain Theory and to examine the intervening role of negative emotions and conditional effects of coping mechanisms (Broidy, 2001).

Finally, while the key independent variables measuring technology use are approximations of daily online activity, they still do not provide information on the content associated with the activity, as noted above. That is, there is no way to know whether the activities like using social media or participating in chats are necessarily more or less related to participation in delinquency or victimization. While the criminological theories outlined can be used to examine why certain effects may be present compared to others, ultimately more granular measures of online activity content and context are needed to make definitive estimations of the role of online activity in delinquency.

Policy Implications. Although additional research is needed to understand how the context and content of different online activities influence delinquency, the results suggest implications for parents, educators, and policymakers. First, it appears that only certain online activities are associated with particular types of delinquency, indicating that a "blanket" approach to decreasing general online screen time would likely be an ineffective strategy for reducing delinquency. Rather, policymakers and parents concerned with how their children's time online is being spent should focus on reducing the time spent on particular activities, as well as monitoring the content of the online activities themselves. For example, social media use on the computer is associated with an increase in forms of in-person delinquency while researching and reading online is associated with a decrease in most forms of in-person and online delinquency. However, social media use may only be problematic for delinquent participation if young people are being exposed to victimization experiences through social media use (cyber bullying, dating violence, etc.) or if the activity is exposing the individual to delinquent peers or additional strains. Likewise, researching online may generally be associated with decreased delinquency, but it may have the opposite influence if young people are being exposed to violent or instructional criminal material (i.e. learning to hack a computer; participating in hate crime chat rooms on 4Chan). Given that parental monitoring is shown to have a moderate influence on both on- and offline forms of delinquency, it may be most effective to monitor how children are spending their time online and the content of their online interactions, rather than simply decreasing or increasing the amount of time allowed online or engaged in a particular activity.

The influence of victimization at the hands of peers both on- and offline appears to be particularly strong for most forms of delinquency assessed here. There is strong indication that experiencing multiple types of victimization, where the individual is "surrounded" by victimization experiences in multiple social domains, may be particularly influential for an individual's perpetration of delinquency. As a result, parents and educators should be aware of students that are dealing with one kind of victimization at home or in the school and seek to understand how those students may be undergoing additional experiences of victimization beyond what is readily apparent. That is, victimization experiences are likely to cluster and increase the risk of delinquent coping, so adults should be privy to victimization experiences that may extend beyond a single domain (school, online, etc.). A small group of individuals (likely less than 15%) are victims of serious polyvictimization at the hands of peers (3 or more forms of victimization) and may represent the students most at risk for delinquent perpetration and further victimization. Advocates for child welfare and policymakers looking to decrease delinquency should work towards providing adolescents proper counseling services that are severe victims of bullying and dating abuse. This is especially important for young boys who are victimized both on- and offline since boys are more likely than girls to perpetrate dating violence when they are polyvictims. Services should be geared towards helping students cope with victimization across different areas in their lives, while addressing the unique differences between on- and offline forms of delinquency.

Finally, it is important to develop services and intervention approaches that can help young people in an abusive dating relationship. Teen dating violence is severely understudied, though dating violence victimization is shown to have a significant

influence on many types of delinquent behavior. The unique characteristics of teen dating violence make it so that counseling and educational services typically used for intimate partner violence among adults may not be effective for preventing dating violence between adolescents. Thus, services that identify victims of multiple types of abuse should be particularly aware of the unique elements of teen dating violence and how they may contribute to delinquency. More so than adult intimate partner violence, teen dating violence appears to be reciprocal in nature, where boys and girls offend at similar rates. This dynamic necessitates a different approach to creating intervention strategies for abusive relationships, as well as a distinctive design for prevention efforts. Services in- and outside of schools for helping those in an abusive relationship should take into account gender differences in the experiences of abuse, as well as differences in victimization experiences at the hands of other peers.

As young people spend an increasing amount of time online, the influence of online communication and technology use will likely continue to have a significant bearing on dating violence experiences amongst teenagers. Therefore, educators and parents should focus on monitoring the activity of young people in relationships not only in person but also online. Policies and services designed to decrease teen dating violence should take a balanced approach to prevention and intervention that considers how social boundaries between online and offline domains blur to create opportunity for both victimization and perpetration. Research and intervention strategies related to delinquency and adolescent violence must consider the reciprocal nature of on- and offline domains to properly assess how to decrease delinquency and improve the everyday lives of young people.

Additional Considerations. The two technological platforms studied here, cell phones and computers, may function differently in the lives of young people. Computers may be considered by adolescents as more of a tool for doing schoolwork, writing, or researching, whereas cell phones may be more of a communication tool for talking to friends (i.e. chatting, texting, etc.) or conducting leisure activities. While computers still facilitate the use of social media applications and web browsing, young people are increasingly using cell phones for most online activity unrelated to school or work. Cell phones may be more common for interactions among young people and may be harder to monitor for parents. As a result, future research should focus predominantly on mobile devices when assessing cyber aggression and interactions that may facilitate in-person delinquency. However, interactions on other devices like computers, tablets, and video game systems should not be ignored.

In addition, future analyses of race, age, and gender differences in online activity as it relates to delinquency should take an intersectional approach. This may be especially important given developmental issues in early, middle, and late adolescents for boys and girls. An intersectional approach may help to provide further evidence of socio-demographic differences beyond the results found here. Differences in cognitive and social development may also be important for unpacking the relationship between polyvictimization and different forms of delinquency.

Though the models in the present analyses control for parental closeness, they do not assess whether the influence of online activities and victimization on delinquency is condition by parental closeness. Since parental closeness is a potentially important conditioning factor, future research should assess this and attempt to better account for

parental relationships in the lives of adolescents. This may be particularly influential across age groups and young people at different stages of development in adolescence. Relatedly, more attention should be paid to the overall positive influence that online activities have on adolescent behaviors. Though the research here focuses on delinquent activity, online access and interaction in the digital realm may serve to improve interpersonal relationships and expose young people to forms of support that simply did not exist twenty years ago. In particular, it is important to assess how online activity relates to one's mental health, sense of well-being, feelings of social support, and quality of relationships with others. Future research should consider these outcomes, alongside delinquent behaviors, to properly assess the full extent of the influence of online activities.

Variety measures of victimization and an aggregate measure of polyvictimization are used here to approximate the influence of peer victimization on delinquency. However, future research should continue to explore ways of measuring victimization and the impact that measurement has on delinquent variables. In particular, research should account not only for the variety and frequency of victimization, but also the timing of victimization as it relates to delinquency. Given the robust relationship between victimization and perpetration, it is crucial to understand how the two relate to one another temporally. Notably, there has been little time-ordered research related to peer abuse and victimization online as they relate to perpetration of delinquent behavior. This research can help to inform how to best measure polyvictimization, and the unique experience of victimization across multiple social domains in the lives of adolescents.

X. Conclusion

The use and availability of online technology continues to expand globally. Adolescents are typically some of the earliest adopters of new technology and they integrate it into their daily lives at a rapid pace. Young people have access to immense new resources to learn, communicate, create, and entertain, often at little or no cost. While the opportunities to use online technology are increasing, it is also important to consider potential negative consequences related to changes in online activity and availability among young people. This study has proposed a theoretical framework for assessing the influence of online behavior on delinquency both in person and online. This framework draws on key theoretical perspectives in criminology including social learning theory, general strain theory, control theories, and routine activities, while also highlighting contributions of polyvictimization research. To fully understand the relationship between online activity and delinquency, it will be useful to take into account the key tenants of these theories including delinquent peer associations, strains encountered online, parental and social controls, and how time is spent online throughout the day.

This project sought to test certain elements of this framework, especially regarding the amount of time spent on particular online activities, parental monitoring, and victimization strain as it relates to delinquent perpetration. Mixed results were found regarding the influence of online activities. As indicated in the Results and Discussion sections, the time spent on certain online activities has a small positive relationship with some forms of delinquency, while time spent on other online activities is unrelated. The strongest support was found for the association between different types of victimization

and delinquency, both on- and offline. In particular, the results indicate that polyvictimization is particularly consequential for perpetration of dating aggression both in person and online.

This project represents initial steps to understanding the influence of online behavior on delinquency, though there is significant opportunity for future research that may enhance our understanding of this relationship. As researchers continue to examine the specific risk factors for delinquency related to online activity, it is important to maintain updated data and utilize new approaches to data collection that harnesses the unique strengths of online devices and applications available to researchers. New research that examines the actual content of online activities will be best positioned to assess its relationship to delinquency and offer intervention strategies for those at greatest risk for both perpetration and victimization. An interdisciplinary approach that draws upon the theoretical and methodological tools from criminology, public health, sociology, and technology studies will be best equipped to further knowledge on this important issue. As technology continues to evolve and present new opportunities for adolescents, research that informs policy and intervention strategies for those at greatest risk will ensure that these young people can remain healthy and safe into adulthood.

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XII. Key Measurements and Scales

Dependent Variable Scales (In-person)

A. In-person or "Offline" General Delinquency

In the past year, have you (Yes/No)…

1. Attacked someone with the intent to hurt him/her (other than a person you may have dated in the past year, whom we already asked you about)
2. Attempted to steal a vehicle
3. Been arrested
4. Been drunk or high at school
5. Carried a handgun
6. Gotten suspended
7. Sold drugs
8. Taken a handgun to school
9. Damaged or destroyed property that didn't belong to you

B. Drug Use

In the past 30 days, how many times have you…(Never, 1-3 times, 4-9 times, 10+ times)

1. Used marijuana, pot, hash, etc.
2. Used hallucinogens
3. Used inhalants
4. Used amphetamines
5. Taken pain relievers not prescribed for a medical condition
6. Take tranquilizers not prescribed for a medical condition

7. Used barbiturates
8. Used heroine
9. Used cocaine

C. Bullying

The following questions are about other youth in your life **other than** a person with whom you might be currently in a relationship or might have been in a relationship recently. Please do not include experiences you have already reported about that person if you answered those questions. In the past year, how often have you done the following things: (Never, sometimes, once or twice a month, once a week, several times a week, everyday)

1. Pushed or shoved a student
2. Hit or kicked a student hard
3. Crashed into a student hard as they walked by
4. Damaged a student's property on purpose
5. Threw something at a student to hit them
6. Threatened to physically harm a student
7. Teased a student by saying mean things to him/her
8. Made rude remarks at a student
9. Made another student feel afraid in school
10. Said things about a student's looks he/she didn't like
11. Made fun of a student by calling him/her names
12. Wouldn't let my friends be friends with a student because I didn't like him or her

13. Got other students to ignore a student
14. Got my friends to turn against a student
15. Didn't invite a student to my place because other people didn't like him/her
16. Left a student out of activities or games on purpose
17. Made another student hide his/her sexual orientation from other students

D. Physical Dating Violence

In the past year, how many times have you ever done the following things to the person that you currently are dating, or if you are not currently dating, the person you most recently dated? Only include when you did it to him/her first. In other words, don't count it if you did it in self‑defense: (Never, 1-3 times, 4-9 times, 10+ times)

1. Scratched him/her
2. Slapped him/her
3. Physically twisted his/her arm
4. Slammed him/her or held him/her against a wall
5. Kicked him/her
6. Bent his/her fingers
7. Bit him/her
8. Tried to choke him/her
9. Pushed, grabbed, or shoved him/her
10. Dumped him/her out of a car
11. Threw something at him/her that hit him/her
12. Burned him/her

13. Hit him/her with a fist
14. Hit him/her with something hard besides a fist
15. Beat him/her up
16. Assaulted him/her with a knife or gun

E. Psychological Dating Violence

In the past year, how many times have you ever done the following things to the person that you currently are dating, or if you are not currently dating, the person you most recently dated? Only include when you did it to him/her first. In other words, don't count it if you did it in self‑defense: (Never, 1-3 times, 4-9 times, 10+ times)

1. Damaged something that belonged to him/her
2. Started to hit him/her but stopped
3. Threatened to hurt him/her
4. Would not let him/her do things with other people
5. Made him/her feel unsafe or uneasy when we spend time together
6. Told him/her they could not talk to a person of the gender that they date
7. Made him/her describe where he/she was every minute of the day
8. Insulted him/her in front of others
9. Put down his/her looks
10. Blamed him/her for bad things he/she did
11. Said things to hurt his/her feelings on purpose
12. Threatened to start dating someone else
13. Did something to make him/her jealous

14. Brought up something from the past to hurt him/her
15. Threatened to hurt myself if he/she broke up with me
16. Made him/her afraid to tell others the truth
17. Showed jealousy
18. Tried to limit his/her contact with family members
19. Tried to limit his/her contact with friends
20. Insisted on knowing who he/she is with and where he/she is at all times
21. Made him/her feel owned or controlled
22. Harmed or threatened someone close to him/her
23. Called him/her names to put them down or make them feel bad

Dependent Variable Scales (Online)

A. Cyber Bullying

In the past year how often have you done the following things: (Never, sometimes, once or twice a month, once a week, several times a week, everyday)

1. Used a cell phone to send other students a video of a student I knew would get him/her into trouble
2. Got other students to send a rude video message to a student's cell phone
3. Used a cell phone to forward a video to a student I knew s/he wouldn't like
4. Sent a video message to other people to get a student into trouble
5. Sent a student a nasty email
6. Sent a student an email threatening to harm him/her
7. Sent a student an instant message or chat to hurt his/her feelings

8. Used a student's instant message account without their permission to send a message that I knew would get them into trouble
9. Created a profile page (like MySpace or YouTube) about a student knowing it would upset him/her
10. Wrote things about a student on a profile page (like MySpace or YouTube) to hurt his/her feelings
11. Called a student names he/she didn't like through a text message
12. Sent a student a cell phone text message knowing it would hurt his/her feelings

B. Online Dating Aggression

In the past year, how often have you done the following things: (Never, 1-3 times, 4-9 times, 10+ times)

1. Posted embarrassing photos or other images of him/her online
2. Sent threatening text messages to him/her
3. Shouted at him/her over the phone
4. Took a video of him/her and sent it to his/her friends without my permission
5. Used his/her social networking account without permission
6. Sent him/her instant messages or chats that made him/her feel scared
7. Wrote nasty things about him/her on his/her profile page (e.g., on Facebook, MySpace, etc.)
8. Created a profile page (e.g., Facebook, MySpace or YouTube) about him/her, knowing it would upset him/her

9. Sent him/her so many messages (e.g., texts, emails, chats) that it made him/her feel unsafe
10. Sent him/her text messages on my cell phone to check up on him/her (e.g., "where are you," "what are you doing," "who are you with")
11. Sent him/her text messages, email, IM, chats, etc., to have sex or engage in sexual acts with him/her when I knew he/she did not want to
12. Spread rumors about him/her using a cell phone, email, IM, web chat, social networking site, etc.
13. Used information from his/her social networking site to harass him/her or put him/her down
14. Made him/her afraid when they did not respond to my cell phone call, text, posting on social networking page, IM, etc.
15. Threatened to harm him/her physically through a cell phone, text message, social networking page, etc.
16. Sent him/her sexual photos or naked photos of myself that I knew she/he did not want
17. Sent him/her sexually suggestive messages that I thought he/she would want
18. Threatened him/her if he/she didn't send a sexual or naked photo of themself
19. Pressured him/her to send a sexual or naked photo of themself

Key Independent Online Activity Variables

A. Computer Activities

How much time per day do you spend doing the following activities on the computer? (No time, 1 hour, 2-4 hours, 5-6 hours, 6+ hours)

1. Using social networking sites (e.g., Facebook, MySpace, etc.)
2. Reading or researching on the internet
3. Visiting websites with user generated content (e.g., Wikipedia)
4. Writing or posting on blogs/microblogs (e.g., Tumblr, Twitter, LiveJournal, etc.)
5. Instant messaging or chatting
6. Using e-mail

B. Cell Phone Activities

How much time per day do you spend doing the following activities on your cell phone? (No time, less than 1 hour, 1 hour, 2-4 hours, 5-7 hours, 7+ hours)

1. Sending instant messages or participating in chats
2. Texting
3. Using social networking sites
4. Using other websites
5. Emailing

C. How do you parents/guardians restrict what websites you look at?

1. Filtering software (e.g. Net Nanny)
2. Computer has to be in a public/open space
3. I'm told not to visit certain sites
4. No restriction on Internet use

Victimization Measures

A. In-person Bullying Victimization

In the past year, how often has someone done the following things to you: (Never, sometimes, once or twice a month, once a week, several times a week, everyday)

1. I was pushed or shoved.
2. I was kicked or hit hard.
3. Students crashed into me on purpose as they walked by.
4. My property was damaged on purpose.
5. Something was thrown at me to hit me.
6. I was threatened to be physically hurt or harmed.
7. I was teased by students saying things to me.
8. A student made rude remarks at me.
9. A student made me feel afraid in school.
10. Things were said about my looks I didn't like.
11. I was called names I didn't like.
12. I student wouldn't be friends with me because other people didn't like me.
13. A student got other students not to have anything to do with me.
14. A student got their friends to turn against me.
15. I wasn't invited to a student's place because other people didn't like me.
16. I was left out of activities with other students.
17. I had to hide my sexual orientation from other students.

B. Cyber Bullying Victimization

In the past year, how often has someone done the following things to you: (Never, sometimes, once or twice a month, once a week, several times a week, everyday)

1. My cell phone account was used without my permission to send a photo or image to other people to get me in trouble.
2. A student got other students to send a rude video message to my cell phone.
3. A student forwarded a video to me cell phone s/he knew I wouldn't like.
4. My cell phone was used without my permission to send a video message to other people to get me in trouble.
5. A student sent me a nasty email.
6. A student sent me an email threatening to harm me.
7. A student sent me an instant message or chat to hurt my feelings.
8. My instant message account was used without my permission to send a message to other students to get me in trouble.
9. A student created a nasty profile page about me.
10. A student put something up on a profile page about me to hurt my feelings.
11. I was called names I didn't like through a text message.
12. A student sent me a text message to hurt my feelings.

C. *Physical Dating Violence*

In the <u>past year</u>, how many times has the person that you currently are dating, or if you are not currently dating, the person you most recently dated done the following things to you? (Never, 1-3 times, 4-9 times, 10+ times)

1. Scratched me
2. Slapped me
3. Physically twisted my arm
4. Slammed me or held me against a wall

5. Kicked me
6. Bent my fingers
7. Bit me
8. Tried to choke me
9. Pushed, grabbed, or shoved me
10. Dumped me out of a car
11. Threw something at me that hit me
12. Burned me
13. Hit me with a fist
14. Hit me with something hard besides a fist
15. Beat me up
16. Assaulted me with a knife or gun

D. *Psychological Dating Violence*

In the past year, how many times has the person that you currently are dating, or if you are not currently dating, the person you most recently dated done the following things to you? (Never, 1-3 times, 4-9 times, 10+ times)

1. Damaged something that belonged to me
2. Started to hit me but stopped
3. Threatened to hurt me
4. Would not let me do things with other people
5. Made me feel unsafe or uneasy when we spend time together
6. Told me I could not talk to a person of the gender that they date
7. Made me describe where I was every minute of the day

8. Insulted me in front of others
9. Put down my looks
10. Blamed me for bad things he/she did
11. Said things to hurt my feelings on purpose
12. Threatened to start dating someone else
13. Did something to make me jealous
14. Brought up something from the past to hurt me
15. Threatened to hurt himself/herself if I broke up with him/her
16. Made me afraid to tell others the truth
17. Showed jealousy
18. Tried to limit my contact with family members
19. Tried to limit my contact with friends
20. Insisted on knowing who I am with and where I am at all times
21. Made me feel owned or controlled
22. Harmed or threatened someone close to me
23. Called me names to put me down or make me feel bad

E. Cyber Dating Aggression

In the past year, how often has the person that you currently are dating, or if you are not currently dating, the person you most recently dated done any of the following things to you? (Never, 1-3 times, 4-9 times, 10+ times)

1. Posted embarrassing photos or other images of me online
2. Sent threatening text messages to me
3. Shouted at me over the phone

4. Took a video of me and sent it to my friends without my permission
5. Used my social networking account without permission
6. Sent me instant messages or chats that made me feel scared
7. Wrote nasty things about me on my profile page (e.g., on Facebook, MySpace, etc.)
8. Created a profile page (e.g., Facebook, MySpace or YouTube) about me, knowing it would upset me
9. Sent me so many messages (e.g., texts, emails, chats) that it made me feel unsafe
10. Sent me text messages on my cell phone to check up on me (e.g., "where are you," "what are you doing," "who are you with")
11. Sent me text messages, email, IM, chats, etc., to have sex or engage in sexual acts with me when he/she knew I did not want to
12. Spread rumors about me using a cell phone, email, IM, web chat, social networking site, etc.
13. Used information from my social networking site to harass me or put me down
14. Made me afraid when I did not respond to my cell phone call, text, posting on social networking page, IM, etc.
15. Threatened to harm me physically through a cell phone, text message, social networking page, etc.
16. Sent me sexual photos or naked photos of themself that he/she knew I did not want

17. Sent me sexually suggestive messages that she/he thought I would want
18. Threatened me if I didn't send a sexual or naked photo of myself
19. Pressured me to send a sexual or naked photo of myself

XIII. Tables and Figures

Table 1

Table 1. General Descriptive Statistics (Pre-imputation)

	# Obs.	Mean	SD	Min.	Max.	Alpha
Demographic Measures						
Female	5,609	0.518	0.500	0.000	1.000	-
Black	5,647	0.066	0.249	0.000	1.000	-
Asian	5,647	0.041	0.198	0.000	1.000	-
White	5,647	0.782	0.413	0.000	1.000	-
Hispanic	5,647	0.095	0.293	0.000	1.000	-
Age	5,641	15.413	1.574	11.000	21.000	-
Grades	5,494	3.575	0.644	1.000	4.000	-
Parental education	4,048	5.863	1.633	2.000	10.000	0.736
Perpetration Measures						
Cyber bully	4,984	0.235	1.209	0.000	12.000	0.925
Online dating aggression	5,222	0.368	1.268	0.000	19.000	0.833
General delinquency	5,324	0.616	1.309	0.000	9.000	0.761
Drug use (no alcohol)	5,272	0.408	1.003	0.000	9.000	0.733
In-person bullying	4,905	1.598	2.868	0.000	17.000	0.885
Dating violence - Physical	5,141	0.411	1.418	0.000	19.000	0.856
Dating violence - Psychological	5,184	0.836	2.169	0.000	23.000	0.878
Computer Activities						
Total time using a computer (daily)	5,526	1.760	0.986	0.000	4.000	
Instant message or chatting	5,531	0.841	1.059	0.000	4.000	-
Email	5,532	0.655	0.776	0.000	4.000	-
Blogs/microblogs	5,532	0.563	0.934	0.000	4.000	-
Reading/researching	5,549	0.994	0.830	0.000	4.000	-
Social networking sites	5,568	1.334	1.037	0.000	4.000	-
Sites w/ user-generated content	5,511	0.670	0.782	0.000	4.000	-
Cell Phone Activities						
Total time using a cell phone (daily)	5,524	2.579	1.332	0.000	4.000	
Instant message or chatting	5,495	1.183	1.563	0.000	5.000	-
Email	5,548	0.454	0.857	0.000	5.000	-
"Other" websites	5,551	0.914	1.217	0.000	5.000	-
Social networking sites	5,532	1.475	1.571	0.000	5.000	-
Texting	5,486	2.874	1.652	0.000	5.000	-
Online Activities - Time/Place						
Computer - Bedroom	5,490	0.389	0.488	0.000	1.000	-

Cell Phone - Bedroom	5,142	0.330	0.470	0.000	1.000	-
Computer - Late at night	5,447	0.084	0.277	0.000	1.000	-
Cell Phone - Late at night	5,304	0.053	0.224	0.000	1.000	-
Parents restrict sites visited?	5,415	0.298	0.457	0.000	1.000	-
Victimization Measures						
In-person bullying	5,061	2.704	3.757	0.000	17.000	0.901
Cyber bullying	5,121	0.458	1.343	0.000	12.000	0.837
Online dating aggression	5,226	0.939	2.155	0.000	19.000	0.860
Dating violence - Physical	5,340	0.735	2.023	0.000	19.000	0.873
Dating violence – Psychological	5,253	2.002	3.943	0.000	23.000	0.920
Psychosocial Measures						
Anger scale	5,303	2.365	3.771	0.000	20.000	0.859
Parental closeness	5,093	3.185	0.977	0.000	4.000	0.769

Table 2

Table 2. Correlation Matrix for All Variables (Pre-imputation)

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Delinquency	1.00													
2. Drug use	0.49	1.00												
3. In-person bullying	0.33	0.20	1.00											
4. Physical dating violence	0.14	0.17	0.21	1.00										
5. Psychological dating violence	0.11	0.15	0.23	0.58	1.00									
6. Cyber dating violence	0.12	0.19	0.25	0.48	0.61	1.00								
7. Cyber bullying	0.15	0.14	0.46	0.19	0.20	0.28	1.00							
8. Computer - Chat	0.06	0.07	0.06	0.08	0.07	0.07	0.07	1.00						
9. Computer - Email	-0.04	-0.02	0.01	0.04	0.01	0.02	0.04	0.29	1.00					
10. Computer - Blogs/posting	0.01	0.05	0.03	0.11	0.11	0.11	0.07	0.34	0.17	1.00				
11. Computer - Research	-0.04	-0.06	-0.02	-0.02	-0.01	-0.03	-0.02	0.11	0.29	0.13	1.00			
12. Computer - Social media	0.06	0.11	0.05	0.12	0.12	0.11	0.07	0.54	0.24	0.38	0.16	1.00		
13. Computer - User sites	-0.02	0.00	0.06	-0.01	-0.01	0.00	0.03	0.14	0.30	0.17	0.52	0.17	1.00	
14. Cell - Chat	0.10	0.11	0.09	0.09	0.08	0.10	0.06	0.43	0.20	0.19	0.05	0.32	0.11	1.00
15. Cell - Email	-0.01	0.06	0.02	0.04	0.02	0.05	0.04	0.18	0.44	0.14	0.11	0.18	0.14	0.34
16. Cell - "Other websites"	0.07	0.10	0.06	0.07	0.05	0.09	0.04	0.21	0.20	0.20	0.11	0.27	0.15	0.40
17. Cell - Social media	0.06	0.10	0.05	0.11	0.14	0.14	0.05	0.33	0.12	0.28	0.01	0.49	0.07	0.49
18. Cell - Texting	0.08	0.11	0.05	0.17	0.24	0.19	0.08	0.26	0.08	0.23	-0.04	0.37	-0.03	0.36
19. Bedroom - Computer	0.03	0.07	0.05	0.07	0.09	0.07	0.07	0.16	0.01	0.19	0.08	0.22	0.07	0.07
20. Bedroom - Cell phone	0.01	0.02	0.01	0.05	0.11	0.09	0.06	0.06	0.00	0.08	-0.04	0.10	-0.04	0.07
21. Late usage - Computer	0.09	0.11	0.04	0.06	0.02	0.04	0.02	0.12	0.05	0.09	-0.03	0.13	-0.01	0.06
22. Late usage - Cell phone	0.03	0.02	0.04	0.06	0.03	0.03	0.04	0.03	0.02	0.07	-0.03	0.05	-0.01	0.04
23. Parental restrictions	-0.10	-0.12	-0.05	-0.05	-0.06	-0.04	-0.03	-0.07	-0.05	-0.13	-0.02	-0.17	-0.08	-0.09
24. Vic – In-person bullying	0.14	0.08	0.42	0.16	0.23	0.22	0.22	0.08	0.04	0.11	0.06	0.06	0.05	0.06
25. Vic - Cyber bullying	0.09	0.08	0.30	0.20	0.29	0.30	0.43	0.12	0.04	0.15	0.01	0.12	0.02	0.11
26. Vic - Online dating aggression	0.20	0.20	0.21	0.42	0.56	0.58	0.19	0.11	0.02	0.14	-0.01	0.15	0.00	0.15
27. Vic - Psychological DV	0.18	0.16	0.20	0.47	0.69	0.46	0.19	0.11	0.00	0.12	-0.03	0.14	-0.04	0.15
28. Vic - Physical DV	0.17	0.20	0.23	0.68	0.55	0.42	0.23	0.06	0.03	0.07	-0.02	0.10	-0.02	0.13
29. Age	0.06	0.16	0.03	0.09	0.13	0.09	0.01	-0.01	0.17	0.07	0.12	0.14	0.17	0.02
30. Gender	-0.14	-0.08	-0.13	0.10	0.12	0.07	-0.01	0.06	0.07	0.25	0.01	0.15	-0.09	0.00
31. Race - Black	0.07	0.02	0.03	0.01	0.00	0.01	-0.03	0.04	0.01	-0.01	0.00	0.03	0.00	0.09
32. Race - White	-0.08	-0.03	-0.04	-0.02	-0.01	0.03	-0.01	-0.09	-0.05	-0.01	-0.08	-0.03	-0.04	-0.06
33. Race - Hispanic	0.09	0.04	0.01	0.09	0.07	0.03	-0.02	0.05	0.01	0.06	0.02	0.06	0.01	0.03
34. Grades	0.25	0.21	0.11	0.03	0.03	-0.01	0.03	0.14	-0.03	0.01	-0.06	0.11	-0.02	0.12
35. Anger	0.31	0.17	0.36	0.21	0.26	0.20	0.17	0.09	0.02	0.08	0.03	0.07	0.07	0.08
36. Parental closeness	-0.18	-0.13	-0.14	-0.07	-0.09	-0.06	-0.07	-0.04	0.04	0.01	0.04	-0.01	0.02	-0.01
37. Parental education	-0.07	-0.02	0.00	-0.08	-0.04	-0.04	0.02	-0.05	0.06	0.01	0.05	-0.08	0.05	0.00

ABBREVIATIONS: Vic = victimization; DV = dating violence

Table 2. Correlation Matrix for All Variables (continued)

Measure	15	16	17	18	19	20	21	22	23	24	25	26	27	28
15. Cell - Email	1.00													
16. Cell - "Other websites"	0.52	1.00												
17. Cell - Social media	0.39	0.63	1.00											
18. Cell - Texting	0.21	0.28	0.51	1.00										
19. Bedroom - Computer	0.04	0.07	0.13	0.11	1.00									
20. Bedroom - Cell phone	0.06	0.06	0.11	0.22	0.19	1.00								
21. Late usage - Computer	0.09	0.06	0.09	0.07	0.16	0.02	1.00							
22. Late usage - Cell phone	0.06	0.06	0.07	0.05	0.01	0.06	0.15	1.00						
23. Parental restrictions	-0.09	-0.12	-0.17	-0.13	-0.16	-0.03	-0.11	-0.05	1.00					
24. Vic – In-person bullying	0.02	0.03	0.00	0.05	0.08	0.03	0.02	0.02	0.01	1.00				
25. Vic - Cyber bullying	0.05	0.05	0.09	0.17	0.09	0.05	0.01	0.02	-0.01	0.54	1.00			
26. Vic - Online dating aggression	0.05	0.12	0.17	0.23	0.06	0.07	0.05	0.04	-0.07	0.25	0.33	1.00		
27. Vic - Psychological DV	0.03	0.09	0.17	0.25	0.07	0.08	0.05	0.03	-0.07	0.24	0.31	0.76	1.00	
28. Vic - Physical DV	0.06	0.09	0.10	0.17	0.07	0.04	0.06	0.04	-0.06	0.20	0.22	0.52	0.61	1.00
29. Age	0.16	0.13	0.15	0.14	0.06	0.03	0.09	0.02	-0.30	-0.03	0.00	0.08	0.10	0.08
30. Gender	0.03	0.02	0.14	0.23	0.06	0.12	-0.02	0.04	0.00	0.04	0.14	0.09	0.10	-0.02
31. Race - Black	0.04	0.05	0.05	0.02	0.00	0.03	0.00	0.02	-0.01	-0.01	-0.02	0.02	0.02	0.01
32. Race - White	-0.03	-0.05	-0.06	0.08	0.00	-0.02	-0.03	-0.05	0.02	0.05	0.05	0.00	-0.01	-0.02
33. Race - Hispanic	0.01	0.04	0.07	0.03	0.02	0.01	-0.01	0.04	-0.01	-0.01	0.01	0.05	0.07	0.05
34. Grades	0.03	0.05	0.10	0.09	0.02	-0.01	0.07	0.05	-0.09	0.02	0.00	0.07	0.08	0.07
35. Anger	-0.02	0.05	0.05	0.09	0.03	0.02	0.06	0.02	-0.04	0.34	0.23	0.25	0.30	0.21
36. Parental closeness	0.02	0.02	0.02	-0.03	-0.04	-0.09	-0.05	-0.04	0.05	-0.14	-0.08	-0.12	-0.14	-0.15
37. Parental education	0.01	0.03	-0.05	-0.10	0.04	-0.03	0.01	-0.03	0.06	0.01	0.01	-0.07	-0.08	-0.03

Table 2. Correlation Matrix for All Variables (continued)

Measure	29	30	31	32	33	34	35	36	37
29. Age	1.00								
30. Gender	-0.02	1.00							
31. Race - Black	-0.01	0.00	1.00						
32. Race - White	-0.01	-0.02	-0.33	1.00					
33. Race - Hispanic	0.03	0.04	0.01	-0.46	1.00				
34. Grades	0.04	-0.10	0.07	-0.09	0.10	1.00			
35. Anger	0.03	0.04	0.02	-0.04	0.01	0.14	1.00		
36. Parental closeness	0.02	0.05	-0.05	0.07	0.00	-0.14	-0.24	1.00	
37. Parental education	-0.10	-0.01	-0.04	0.11	-0.21	-0.21	-0.06	0.08	1.00

ABBREVIATIONS: Vic = victimization; DV = dating violence

Table 3

Table 3. Imputed OLS Regression Models, Offline Delinquency (N = 5,647)

	Delinquency	Delinquency [F]	Drug Use	Drug Use [F]	Bullying	Bullying [F]	Physical DV	Physical DV [F]	Psych DV	Psych DV [F]
Computer Activities										
Chat	0.090**	0.026	0.027	0.006	0.141**	0.026	-0.016	-0.030	-0.021	-0.025
	(0.072)	(0.021)	(0.028)	(0.006)	(0.051)	(0.009)	(-0.011)	(-0.022)	(-0.010)	(-0.012)
Email	-0.042	-0.015	-0.020	-0.028	-0.048	-0.023	0.035	0.013	0.011	-0.018
	(-0.025)	(-0.009)	(-0.015)	(-0.022)	(-0.013)	(-0.006)	(0.018)	(0.007)	(0.004)	(-0.006)
Blogs/posting online	-0.038	-0.012	0.003	0.003	0.051	0.001	0.085**	0.004	0.123**	-0.026
	(-0.027)	(-0.009)	(.003)	(0.003)	(0.016)	(0.000)	(0.054)	(0.002)	(0.051)	(-.011)
Research	-0.144**	-0.081**	-0.087**	-0.048**	-0.364**	-0.291**	-0.107**	-0.066**	-0.112**	-0.104**
	(-0.091)	(-0.051)	(-0.071)	(-0.039)	(-0.103)	(-0.082)	(-0.060)	(-0.037)	(-0.041)	(-0.039)
Social media	0.016	0.004	0.033	0.024	0.113*	0.102*	0.076**	0.059**	0.029	0.019
	(0.013)	(0.003)	(0.034)	(.024)	(0.040)	(0.036)	(0.054)	(0.041)	(0.014)	(0.009)
Sites w/ user generated content	0.080**	0.006	0.040	-0.007	0.279**	0.111	-0.001	-0.009	0.010	0.015
	(0.048)	(0.003)	(0.031)	(-0.005)	(0.074)	(0.029)	(-0.000)	(-0.005)	(0.004)	(0.005)
Cell Phone Activities										
Chat applications	0.037*	0.005	0.014	0.002	0.074*	0.010	-0.009	-0.018	-0.065**	-0.059**
	(0.044)	(0.005)	(0.022)	(0.003)	(0.039)	(0.005)	(-0.010)	(-0.019)	(-0.046)	(-0.041)
Email	-0.049	-0.052*	0.005	-0.006	0.017	-0.024	-0.006	-0.033	-0.025	-0.030
	(-0.032)	(-0.034)	(0.004)	(-0.005)	(0.005)	(-0.007)	(-0.003)	(-0.019)	(-0.009)	(-0.012)
"Other" websites	0.073**	0.030	0.056**	0.030**	0.114*	0.028	0.031	0.009	-0.013	-0.019
	(0.068)	(0.027)	(0.067)	(0.037)	(0.047)	(0.011)	(0.026)	(0.007)	(-0.007)	(-0.010)
Social media	0.009	0.024	-0.001	0.009	-0.079	-0.005	0.010	0.004	0.082**	0.031
	(0.011)	(.028)	(-0.001)	(0.015)	(-0.042)	(-0.003)	(0.011)	(0.004)	(0.058)	(0.022)
Texting	0.008	-0.002	0.024*	0.005	0.045	0.018	0.089**	-0.003	0.220**	0.045*
	(0.010)	(-0.003)	(0.039)	(0.009)	(0.025)	(0.010)	(0.100)	(-0.003)	(0.162)	(0.033)
Most Used in Bedroom										
Computer	0.012	0.014	0.026	0.020	0.055	0.011	0.007	-0.021	0.122	0.038
	(0.005)	(0.005)	(.012)	(0.010)	(0.009)	(0.002)	(0.002)	(-0.007)	(0.027)	(0.008)

Cell Phone	-0.048 (-0.017)	-0.036 (-0.013)	-0.060 (-0.028)	-0.058* (-0.027)	-0.095 (-0.015)	-0.115 (-0.018)	0.048 (0.015)	-0.001 (-0.000)	0.194** (0.041)	0.083 (0.018)
Most Used Late at Night										
Computer	0.436** (0.092)	0.177** (0.037)	0.333** (0.091)	0.150** (0.041)	0.351* (0.033)	-0.140 (-0.013)	0.129 (0.024)	-0.079 (-0.015)	0.096 (0.012)	-0.120 (-0.015)
Cell Phone	0.263** (0.045)	0.112 (0.019)	0.128 (0.028)	0.039 (0.009)	0.384 (0.029)	0.218 (0.017)	0.165 (0.025)	0.002 (0.000)	0.481** (0.048)	0.283** (0.028)
Parents restrict website access?	-0.233** (-0.081)	-0.099** (-0.035)	-0.189** (-0.086)	-0.075* (-0.034)	-0.222* (-0.035)	-0.122 (-0.019)	-0.135** (-0.042)	-0.044 (-0.014)	-0.184** (-0.037)	-0.026 (-0.005)
Victimization										
In-Person bullying		0.007 (0.020)		-0.006 (-0.023)		0.194** (0.252)		-0.008 (-0.019)		0.006 (0.010)
Cyber bullying		0.005 (0.005)		0.053** (0.072)		0.268** (0.123)		0.086** (0.079)		0.147** (0.089)
Cyber dating aggression		0.065** (0.110)		0.063** (0.139)		-0.036 (-0.027)		-0.010 (-0.016)		-0.011 (-0.011)
Psychological dating violence		-0.009 (-0.029)		-0.038** (-0.151)		0.036* (0.049)		0.058** (0.162)		0.303** (0.547)
Physical dating violence		0.082** (0.130)		0.105** (0.214)		0.144** (0.101)		0.354** (0.497)		0.062** (0.058)
Age		0.038** (0.046)		0.073** (0.114)		0.037 (0.020)		0.025* (0.026)		0.109** (0.076)
Female		-0.390** (-0.148)		-0.129** (-0.064)		-0.861** (-0.146)		0.248** (0.084)		0.262** (0.059)
Race										
Black		0.262** (0.049)		-0.047 (-0.011)		0.181 (0.015)		0.189** (0.032)		0.181 (0.020)
White		-0.0435 (-0.014)		-0.008 (-0.003)		-0.219 (-0.031)		-0.016 (-0.005)		0.029 (0.005)
Hispanic		0.166** (0.037)		0.004 (0.001)		-0.150 (-0.015)		0.150* (0.030)		0.179 (0.023)
Expected grades		-0.315** (-0.155)		-0.206** (-0.131)		-0.146* (-0.032)		0.001 (0.001)		0.044 (0.013)
Parental education		0.015 (0.019)		0.018 (0.030)		0.081** (0.046)		-0.003 (-0.004)		0.016 (0.012)

Anger		0.072** (0.206)		0.036** (0.136)		0.151** (0.194)		0.032** (0.082)		0.048** (0.082)
Parental closeness		-0.091** (-0.068)		-0.079** (-0.077)		-0.072 (-0.024)		0.055** (0.036)		0.069** (0.030)
Constant	0.582**	-0.262	0.323**	-0.943**	1.396**	0.158	0.114*	-0.641**	0.158	-2.091**
R-square	0.053	0.248	0.050	0.202	0.032	0.293	0.040	0.434	0.059	0.450
Adjusted R-square	0.050	0.244	0.047	0.198	0.029	0.290	0.037	0.431	0.057	0.447

Standardized coefficients in parentheses
** = <.01
* = <.05
ABBREVIATIONS: F = fully adjusted model; Psych = psychological; DV = dating violence

Table 4

Table 4. Imputed OLS Regression Models, Cyber Delinquency (N = 5,647)

	Cyber Bullying	Cyber Bullying [F]	Dating Aggression	Dating Aggression [F]
Computer Activities				
Chat	0.058**	0.030	0.034	0.009
	(0.050)	(0.026)	(0.027)	(0.007)
Email	0.039	0.026	0.046	0.027
	(0.025)	(0.016)	(0.027)	(0.016)
Blogs/posting online	0.078**	0.031	0.120**	0.040*
	(0.059)	(0.024)	(0.084)	(0.028)
Research	-0.106**	-0.075**	-0.132**	-0.096**
	(-0.072)	(-0.051)	(-0.083)	(-0.060)
Social media	0.014	0.012	0.023	0.015
	(0.012)	(0.010)	(0.018)	(0.011)
Sites w/ user generated content	0.040	0.009	0.038	0.008
	(0.026)	(0.006)	(0.022)	(0.005)
Cell Phone Activities				
Chat applications	0.011	-0.008	-0.029	-0.036**
	(0.014)	(-0.010)	(-0.034)	(-0.043)
Email	0.068**	0.048*	-0.009	-0.018
	(0.048)	(0.034)	(-0.006)	(-0.012)
"Other" websites	0.003	-0.011	0.024	-0.000
	(0.003)	(-0.011)	(0.022)	(-0.000)
Social media	-0.021	-0.007	0.030	0.020
	(-0.027)	(-0.010)	(0.036)	(0.024)
Texting	0.020	-0.007	0.084**	0.016
	(0.027)	(-0.009)	(0.104)	(0.020)
Most Used in Bedroom				
Computer	0.025	0.001	-0.023	-0.033
	(0.010)	(0.000)	(-0.008)	(-0.012)
Cell Phone	0.012	0.006	0.067	0.041
	(0.005)	(0.002)	(0.024)	(0.015)
Most Used Late at Night				
Computer	0.083	-0.069	0.184**	0.014
	(0.019)	(-0.016)	(0.038)	(0.003)
Cell Phone	0.056	-0.002	0.193*	0.066
	(0.010)	(-0.000)	(0.032)	(0.011)
Parents restrict website access?	-0.082*	-0.084*	-0.038	0.005
	(-0.031)	(-0.031)	(-0.013)	(0.002)
Victimization Types				
In-Person bullying		0.001		-0.013*
		(0.002)		(-0.037)
Cyber bullying		0.350**		0.184**
		(0.387)		(0.188)

Cyber dating violence		-0.000 (-0.000)		0.247** (0.413)
Psychological dating violence		-0.005 (-0.016)		-0.006 (-0.017)
Physical dating violence		0.074** (0.125)		0.085** (0.132)
Age		0.002 (0.003)		0.022* (0.026)
Female		-0.140** (-0.057)		-0.006 (-0.002)
Race				
Black		0.021 (0.004)		0.169** (0.032)
White		-0.006 (-0.002)		0.028 (0.009)
Hispanic		-0.043 (-0.010)		0.040 (0.009)
Expected grades		-0.063* (-0.033)		0.012 (0.006)
Parental education		0.022** (0.030)		0.007 (0.009)
Anger		0.020** (0.062)		0.018** (0.051)
Parental closeness		-0.024 (-0.019)		0.032 (0.023)
Constant	0.121*	-0.052	0.047	-0.492*
R-square	0.027	0.227	0.051	0.369
Adjusted R-square	0.024	0.223	0.049	0.365

Standardized coefficients in parentheses
** = <.01
* = <.05
ABBREVIATIONS: F = fully adjusted model

Table 5

Table 5. Imputed OLS Regression Models for Total Time Spent on Computer and Cell Phone (N = 5,647)

	Delinquency	Drug Use	Bullying	Physical DV	Psych DV	Cyber Bullying	Online Dating Aggression
Total Computer Use	-0.050** (-0.037)	-0.040** (-0.039)	0.036 (0.012)	0.028 (0.019)	-0.070** (-0.030)	0.014 (0.011)	0.010 (0.007)
Total Cell Phone Use	0.044** (0.045)	-0.048** (0.063)	0.087** (0.039)	0.001 (0.001)	0.036 (0.026)	0.001 (0.001)	0.023 (0.023)
Constant	-0.199	-0.918**	0.269	-0.638**	-2.004**	-0.063	-0.524**
R-square	0.245	0.205	0.287	0.431	0.448	0.220	0.363
Adjusted R-square	0.242	0.202	0.285	0.429	0.446	0.217	0.360

NOTES: Models control for all factors used in Tables 3 & 4
Standardized coefficients in parentheses

** = <.01
* = <.05

Table 6

Table 6. Imputed OLS Regression Models for Total Time Spent Online (N = 5,647)

	Delinquency	Drug Use	Bullying	Physical DV	Psych DV	Cyber Bullying	Online Dating Aggression
Total Time Online	0.005 (0.007)	0.013 (0.022)	0.075** (0.043)	0.014 (0.016)	-0.006 (-0.005)	0.005 (0.007)	0.017 (0.023)
Constant	-0.103	-0.831**	0.389	-0.533*	-1.991**	0.006	-0.445*
R-square	0.238	0.191	0.290	0.430	0.446	0.227	0.366
Adjusted R-square	0.235	0.189	0.287	0.428	0.444	0.224	0.364

NOTES: Models control for all factors used in prior multivariate models (Tables 3-5)
Standardized coefficients in parentheses

** = <.01
* = <.05

Table 7

Table 7. Polyvictimization Descriptive Statistics (Pre-Imputation)

	N	Mean	Std. Deviation	Min.	Max.	Alpha
In-person Bullying	5,061	2.704	3.757	0.000	17.000	0.901
Cyber Bullying	5,121	0.458	1.343	0.000	12.000	0.837
Cyber Dating Violence	5,226	0.939	2.155	0.000	19.000	0.860
Physical Dating Violence	5,340	0.735	2.023	0.000	19.000	0.873
Psychological Dating Violence	5,253	2.002	3.943	0.000	23.000	0.920
Polyvictimization Variety	4,518	1.546	1.458	0.000	5.000	0.678

Table 8

Table 8. Number of Victimization Types Experienced (Pre-Imputation - N = 4,518)

	Frequency	% of Sample	Cumulative %
Zero types	1,338	29.61	29.61
One type	1,293	28.62	58.23
Two types	758	16.78	75.01
Three types	531	11.75	86.76
Four types	405	8.96	95.73
Five types	193	4.27	100

Table 9

Table 9. Imputed OLS Regression Models for Effects of Polyvictimization (N = 5,647)

	Delinquency	Drug Use	Bullying	Physical DV	Psych DV	Cyber Bullying	Online DV
Polyvictimization	0.138**	0.088**	0.533**	0.363**	0.691**	0.151**	0.317**
	(0.160)	(0.133)	(0.275)	(0.374)	(0.469)	(0.187)	(0.363)
Computer Activities							
Chat	0.025	0.005	0.021	-0.046	-0.037	0.031	0.016
	(0.020	(0.006)	(0.007)	(-0.033)	(-0.017)	(0.027)	(0.013)
Email	-0.005	-0.013	0.021	0.039	-0.012	0.054	0.055
	(-0.003)	(-0.010)	(0.005)	(0.020)	(-0.004)	(0.035)	(0.032)
Blogs/posting online	-0.006	0.014	0.047	0.021	-0.014	0.066**	0.080**
	(-0.004)	(0.013)	(0.015)	(0.013)	(-0.006)	(0.051)	(0.056)
Research	-0.088**	-0.060**	-0.254**	-0.099**	-0.113**	-0.079**	-0.117**
	(-0.055)	(-0.049)	(-0.072)	(-0.056)	(-0.042)	(-0.054)	(-0.073)
Social media	0.004	0.025	0.101*	0.058*	-0.003	0.008	0.010
	(0.003)	(0.026)	(0.036)	(0.041)	(-0.001)	(0.007)	(0.008)
Sites w/ user generated content	0.011	-0.000	0.120*	-0.007	-0.002	0.013	0.018
	(0.006)	(-0.000)	(0.032)	(-0.004)	(-0.001)	(0.008)	(0.010)
Cell Phone Activities							
Chat applications	0.006	0.004	0.028	-0.010	-0.051*	0.002	-0.030*
	(0.007)	(0.006)	(0.015)	(-0.011)	(-0.036)	(0.002)	(-0.036)
Email	-0.043	0.004	0.035	0.011	0.001	0.073**	-0.002
	(-0.028)	(0.004)	(0.010)	(0.006)	(0.000)	(0.051)	(-0.002)
"Other" websites	0.039**	0.039**	0.042	0.028	-0.012	-0.010	0.016
	(0.036)	(0.047)	(0.017)	(0.023)	(-0.007)	(-0.010)	(0.015)
Social media	0.019	0.003	-0.037	-0.009	0.049	-0.012	0.024
	(0.023)	(0.005)	(-0.020)	(-0.009)	(0.034)	(-0.015)	(0.029)
Texting	-0.009	0.003	-0.034	0.002	0.039	-0.007	0.015
	(-0.012)	(0.004)	(-0.019)	(0.002)	(0.029)	(-0.010)	(0.018)
Most Used in Bedroom							
Computer	0.011	0.015	0.030	-0.005	0.082	0.014	-0.036
	(0.004)	(0.007)	(0.005)	(-0.002)	(0.018)	(0.005)	(-0.013)
Cell Phone	-0.046	-0.068	-0.133	-0.019	0.058**	-0.005	0.020
	-0.016)	(-0.031)	(-0.021)	(-0.006)	(0.013)	(-0.020)	(0.007)
Most Used Late at Night							
Computer	0.208**	0.192**	-0.082	0.025	-0.078	-0.006	0.092
	(0.044)	(0.053)	(-0.008)	(0.005)	(-0.010)	(-0.001)	(0.019)
Cell Phone	0.134	0.061	0.253	0.060	0.343	0.023	0.135
	(0.023)	(0.013)	(0.019)	(0.009)	(0.034)	(0.004)	(0.023)
Parents restrict website access?	-0.095**	-0.072*	-0.030	-0.042	0.017	-0.042	0.038
	(-0.033)	(-0.032)	(-0.005)	(-0.013)	(0.003)	(-0.016)	(0.013)

Age	0.036** (0.043)	0.071** (0.111)	-0.017 (-0.009)	0.032* (0.034)	0.122** (0.086)	-0.010 (-0.012)	0.023* (0.027)
Female	-0.428** (-0.163)	-0.178** (-0.088)	-0.879** (-0.149)	0.135** (0.045)	0.348** (0.078)	-0.127** (-0.052)	-0.026 (-0.010)
Race							
Black	0.289** (0.055)	-0.015 (-0.004)	0.186 (0.016)	0.263** (0.044)	0.228* (0.025)	0.045 (0.009)	0.252** (0.047)
White	-0.065 (-0.020)	-0.030 (-0.012)	-0.170 (-0.024)	-0.118* (-0.033)	-0.055 (-0.010)	-0.004 (-0.001)	-0.002 (-0.001)
Hispanic	0.122 (0.027)	-0.036 (-0.010)	-0.253 (-0.025)	0.047 (0.009)	0.049 (0.006)	-0.089 (-0.021)	-0.070 (-0.015)
Expected grades	-0.322** (-0.158)	-0.213** (-0.136)	-0.138* (-0.030)	-0.046 (-0.020)	0.006 (0.002)	-0.065* (-0.034)	0.004 (0.002)
Parental education	0.012 (0.015)	0.017 (0.027)	0.087** (0.049)	-0.015 (-0.017)	-0.004 (-0.003)	0.028* (0.038)	0.001 (0.001)
Anger	0.072** (0.208)	0.036** (0.136)	0.201** (0.259)	0.044** (0.112)	0.072** (0.122)	0.039** (0.119)	0.030** (0.087)
Parental closeness	-0.095** (-0.071)	-0.086** (-0.083)	-0.104** (-0.035)	0.028 (0.019)	0.064* (0.028)	-0.038* (-0.030)	0.018 (0.014)
Constant	-0.257	-0.930**	0.882	-0.793**	-2.650**	-0.023	-0.690**
R-square	0.233	0.160	0.236	0.213	0.317	0.095	0.198
Adjusted R-square	0.230	0.156	0.233	0.209	0.314	0.090	0.194

Standardized coefficients in parentheses

** = <.01

* = <.05

ABBREVIATIONS: Psych = psychological; DV = dating violence

Figure 1

Figure 1.

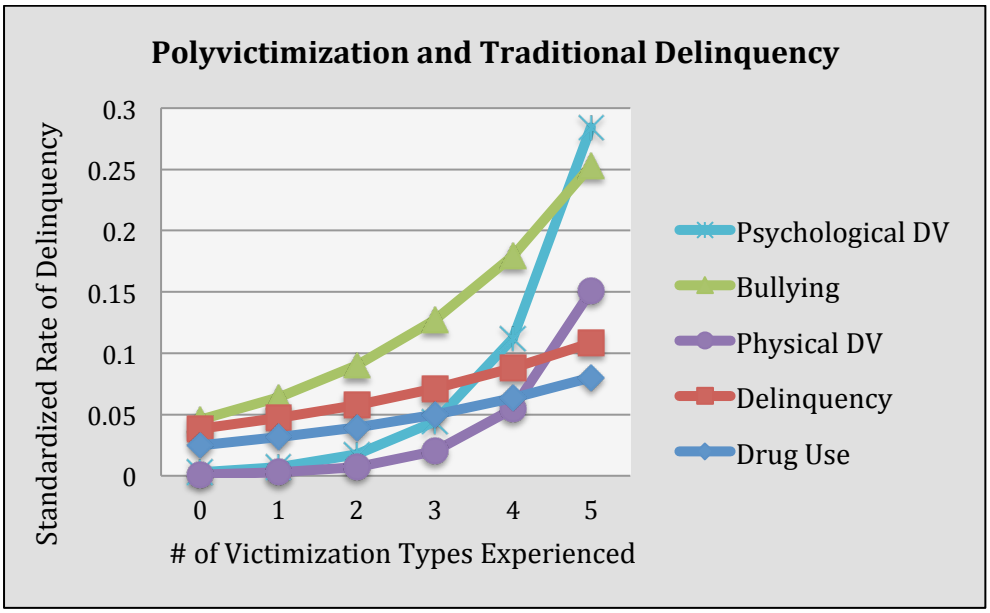

Figure 2

Figure 2.

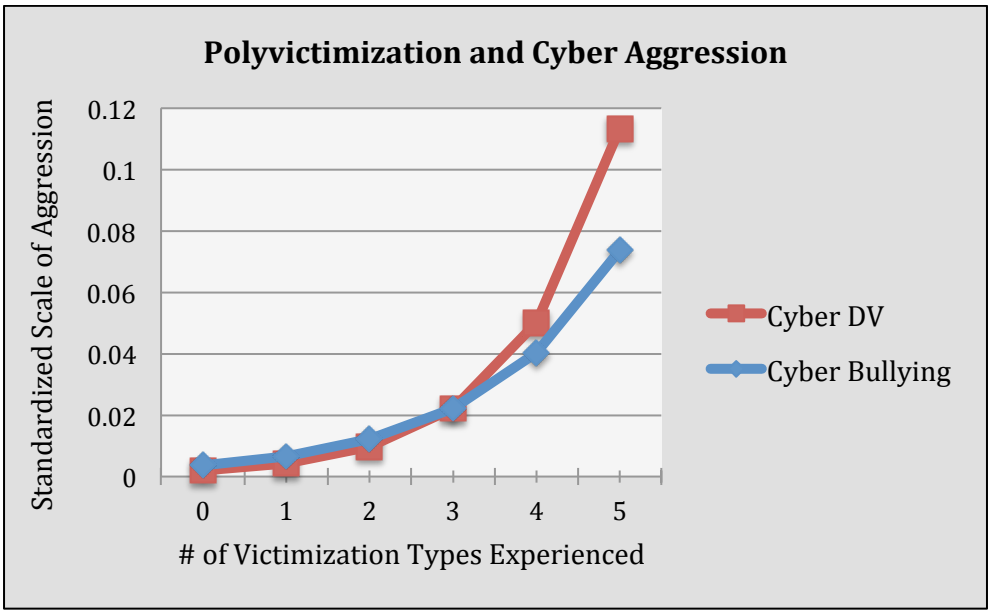

Figure 3

Figure 3.

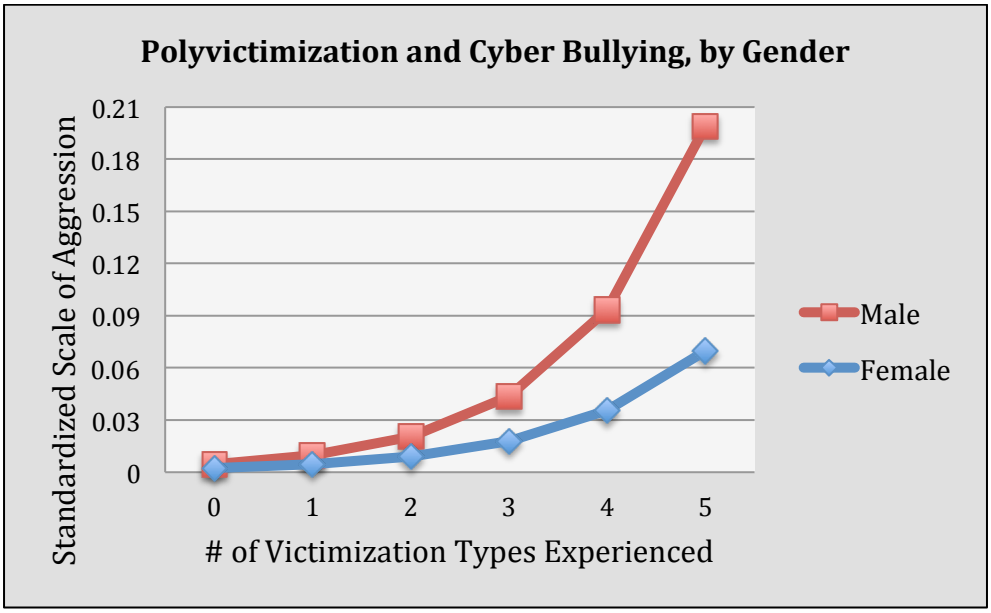

Figure 4

Figure 4.

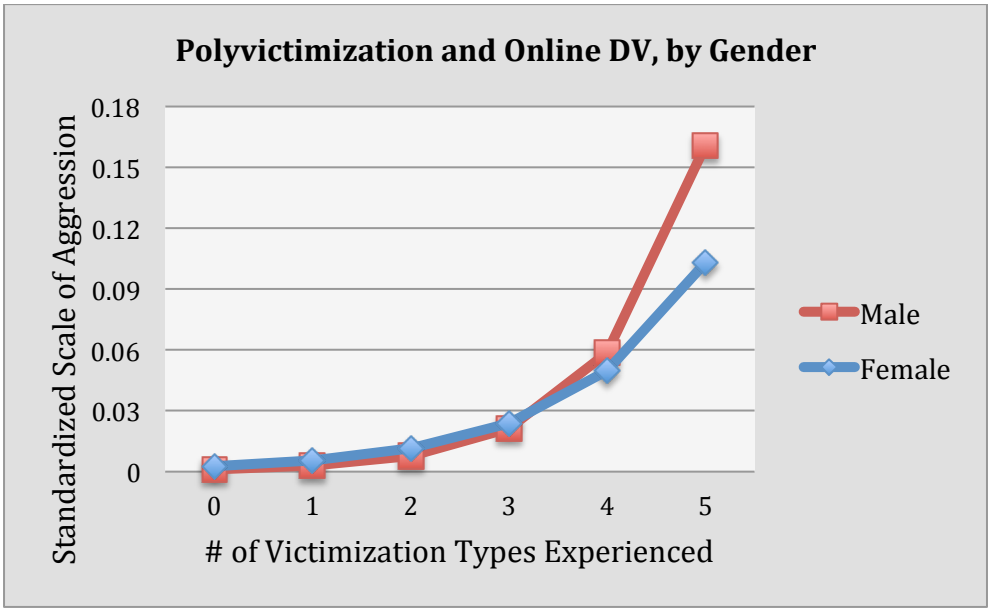

Table 10

Table 10. Imputed OLS Regression Models for Effects of Polyvictimization Thresholds (N = 5,647)

	Delinquency	Drug Use	Bullying	Physical DV	Psych DV	Cyber Bullying	Online Dating Aggression
Individual Victimization							
Bullying	0.010	-0.025	0.248**	-0.027	-0.020	0.003	-0.032
Cyber bullying	0.010	0.068**	0.109**	0.062**	0.043**	0.376**	0.145**
Cyber DV	0.100**	0.111**	-0.023	-0.015	0.010	-0.009	0.403**
Physical DV	0.090**	0.174**	0.086**	0.497**	0.081**	0.118**	0.094**
Psychological DV	-0.041	-0.105**	0.039	0.141**	0.462**	0.058*	0.013
Polyvictimization Thresholds							
3+ Types	0.100**	0.042*	0.030	0.036*	0.055**	-0.033	0.024
4+ Types	-0.020	-0.016	0.001	0.006	0.113**	-0.039	0.039**
Adjusted R2	0.225	0.172	0.272	0.422	0.480	0.020	0.363

NOTES: All models control for computer/cell phone activities, place most used, website access control by parents, age, gender, race, expected grades, anger, parental closeness, and parental education

All coefficients presented are standardized

ABBREVIATIONS: DV = dating violence

** = <.01

* = <.05

Table 11

Table 11. Descriptive Statistics for Cyber Perpetration, Online Activities, and Victimization, by School Age Group (Pre-imputation)

	Middle School			*High School*			
	Obs. #	**Mean**	**SD**	**Obs. #**	**Mean**	**SD**	**Range**
Online perpetration							
Cyber bullying	500	0.12	1.00	4,484	0.25*	1.23	0-12
Online dating aggression	601	0.13	1.16	4,621	0.40*	1.28	0-19
Computer activities							
Instant message or chatting	630	0.83	1.08	4,901	0.84	1.06	0-4
Email	628	0.47	0.73	4,904	0.68*	0.78	0-4
Blogs/posting online	633	0.39	0.76	4,899	0.59*	0.95	0-4
Reading/research	638	0.80	0.74	4,911	1.02*	0.84	0-4
Social networking sites	637	1.10	1.13	4,931	1.36*	1.02	0-4
Visiting sites w/ user generated content	629	0.47	0.69	4,882	0.70*	0.79	0-4
Cell phone activities							
Instant message or chatting	629	1.09	1.54	4,866	1.20	1.57	0-5
Email	640	0.31	0.77	4,908	0.47*	0.88	0-5
"Other" websites	641	0.63	1.10	4,910	0.95*	1.23	0-5
Social networking sites	636	1.00	1.50	4,896	1.54*	1.57	0-5
Texting	631	2.27	1.74	4,855	2.95*	1.62	0-5
Time/Location/Restriction							
Computer most used in bedroom	630	0.28	0.45	4,860	0.40*	0.49	0-1
Cell most used in bedroom	616	0.28	0.45	4,526	0.34*	0.47	0-1
Computer most used late at night	626	0.04	0.20	4,821	0.09*	0.29	0-1
Cell most used late at night	618	0.04	0.19	4,686	0.05	0.23	0-1
Parental website restrictions	610	0.53	0.50	4,805	0.27*	0.44	0-1
Victimization							
Traditional bullying	529	2.08	3.41	4,532	2.78*	3.79	0-17
Cyber bullying	531	0.25	1.01	4,590	0.48*	1.37	0-12
Cyber dating aggression	603	0.30	1.15	4,623	1.02*	2.24	0-19
Psychological dating aggression	610	0.71	2.29	4,643	2.17*	4.08	0-23

Physical dating aggression	628	0.31	1.54	4,712	0.79*	2.07	0-19

* = Two-sample t-test statistically significant for age group differences w/ equal variances across means (p<.05)

Table 12

Table 12. Descriptive Statistics for Cyber Perpetration, Online Activities, and Victimization, by Gender (Pre-imputation)

	Boys			*Girls*			
	Obs. #	**Mean**	**SD**	**Obs. #**	**Mean**	**SD**	**Range**
Online perpetration							
Cyber bullying	2,329	0.26	1.49	2,624	0.20	0.85	0-12
Online dating aggression	2,455	0.30	1.30	2,737	0.42*	1.17	0-19
Computer activities							
Instant message or chatting	2,629	0.77	1.01	2,866	0.90*	1.10	0-4
Email	2,629	0.61	0.78	2,867	0.70*	0.77	0-4
Blogs/posting online	2,629	0.34	0.72	2,867	0.77*	1.05	0-4
Reading/research	2,644	0.96	0.84	2,869	1.03*	0.82	0-4
Social networking sites	2,650	1.18	1.00	2,882	1.47*	1.05	0-4
Visiting sites w/ user generated content	2,618	0.74	0.83	2,857	0.60*	0.72	0-4
Cell phone activities							
Instant message or chatting	2,608	1.15	1.50	2,852	1.21	1.62	0-5
Email	2,635	0.45	0.88	2,878	0.45	0.83	0-5
"Other" websites	2,642	0.91	1.20	2,874	0.91	1.22	0-5
Social networking sites	2,640	1.26	1.48	2,858	1.67*	1.62	0-5
Texting	2,622	2.50	1.64	2,831	3.22*	1.59	0-5
Time/Location/Restriction							
Computer most used in bedroom	2,621	0.36	0.48	2,834	0.42*	0.49	0-1
Cell most used in bedroom	2,465	0.27	0.44	2,649	0.39*	0.49	0-1
Computer most used late at night	2,594	0.09	0.29	2,818	0.07*	0.26	0-1
Cell most used late at night	2,526	0.05	0.22	2,748	0.06	0.23	0-1
Parental website restrictions	2,576	0.29	0.45	2,805	0.31	0.46	0-1
Victimization							
In-person bullying	2,366	2.52	3.70	2,665	2.84*	3.79	0-17
Cyber bullying	2,405	0.31	1.28	2,686	0.58*	1.36	0-12
Cyber dating aggression	2,483	0.81	2.05	2,714	1.04*	2.17	0-19

Psychological dating aggression	2,495	1.58	3.34	2,728	2.36*	4.32	0-23
Physical dating aggression	2,525	0.84	2.17	2,784	0.60*	1.70	0-19

* = Two-sample t-test statistically significant for gender differences w/ equal variances across means (p<.05)

Table 13

Table 13. Descriptive Statistics for Cyber Perpetration, Online Activities, and Victimization, by Race (Pre-imputation)

	White			*Black*			
	Obs. #	**Mean**	**SD**	**Obs. #**	**Mean**	**SD**	**Range**
Online perpetration							
Cyber bullying	3,962	0.23	1.13	300	0.34	1.73	0-12
Online dating aggression	4,137	0.35	1.18	318	0.64*	1.95	0-19
Computer activities							
Instant message or chatting	4,326	0.77	1.00	369	1.16*	1.28	0-4
Email	4,329	0.63	0.73	369	0.68	0.95	0-4
Blogs/posting online	4,325	0.54	0.91	369	0.61	1.01	0-4
Reading/research	4,342	0.97	0.80	368	1.05	0.95	0-4
Social networking sites	4,359	1.29	0.99	370	1.61*	1.28	0-4
Visiting sites w/ user generated content	4,308	0.65	0.75	366	0.74	0.90	0-4
Cell phone activities							
Instant message or chatting	4,305	1.09	1.51	360	1.68*	1.77	0-5
Email	4,349	0.43	0.80	366	0.61*	1.10	0-5
"Other" websites	4,352	0.86	1.16	365	1.32*	1.56	0-5
Social networking sites	4,340	1.38	1.51	363	2.06*	1.85	0-5
Texting	4,308	2.90	1.60	358	3.01	1.88	0-5
Time/Location/Restriction							
Computer most used in bedroom	4,304	0.39	0.49	358	0.37	0.48	0-1
Cell most used in bedroom	4,047	0.33	0.47	329	0.33	0.47	0-1
Computer most used late at night	4,280	0.08	0.27	350	0.12*	0.32	0-1
Cell most used late at night	4,182	0.04	0.20	337	0.11*	0.31	0-1
Parental website restrictions	4,244	0.30	0.46	359	0.25	0.44	0-1
Victimization							
In-person bullying	4,017	2.76	3.76	313	2.65	3.92	0-17
Cyber bullying	4,062	0.46	1.28	315	0.55	1.94	0-12
Cyber dating aggression	4,129	0.91	2.11	329	1.40*	3.01	0-19
Psychological dating aggression	4,135	1.91	3.86	343	2.68*	4.37	0-23

Physical dating aggression	4,204	0.66	1.89	350	1.23*	2.74	0-19

* = Two-sample t-test statistically significant for racial differences w/ equal variances across means (p<.05)

Table 14

Table 14. Imputed OLS Regression Models for Cyber Perpetration, by School Age Group

	Middle School (N = 654)		*High School (N = 4,993)*	
	Cyber bullying	**Online dating aggression**	**Cyber bullying**	**Online dating aggression**
Computer Activities				
Chat	-0.031 (-0.032)	0.031 (0.028)	0.035 (0.030)	0.001 (0.001)
Email	0.043 (0.030)	0.110 (0.068)	0.024 (0.015)	0.019 (0.011)
Blogs/posting online	0.043 (0.032)	0.070 (0.045)	0.032 (0.025)	0.039* (0.028)
Research	-0.119 (-0.085)	-0.139 (-0.087)	-0.070** (-0.047)	-0.086** (-0.053)
Social media	0.025 (0.027)	0.024 (0.022)	0.009 (0.007)	0.004 (0.003)
Visiting sites w/ user generated content	0.033 (0.021)	-0.025 (-0.014)	0.007 (0.004)	0.021 (0.012)
Cell Phone Activities				
Chat applications	0.013 (0.019)	-0.050 (-0.065)	-0.011 (-0.014)	-0.038** (-0.044)
Email	-0.105 (-0.078)	-0.165* (-0.108)	0.065*# (0.046)	0.004 (0.002)
"Other" websites	0.012 (0.012)	0.062 (0.057)	-0.013 (-0.013)	-0.010 (-0.010)
Social media	0.007 (0.010)	-0.002 (-0.002)	-0.006 (-0.007)	0.027 (0.031)
Texting	-0.008 (0.013)	0.026 (0.039)	-0.008 (-0.010)	0.017 (0.020)
Most Used in Bedroom				
Computer	-0.083 (-0.036)	-0.095 (-0.036)	0.011 (0.004)	-0.020 (-0.007)
Cell Phone	0.045 (0.019)	-0.055 (-0.021)	0.005 (0.002)	0.057 (0.020)
Most Used Late at Night				
Computer	-0.318 (-0.061)	-0.145 (-0.024)	-0.058 (-0.013)	0.022 (0.005)
Cell Phone	-0.042 (-0.008)	-0.012 (-0.002)	0.004 (0.001)	0.082 (0.019)
Parents restrict website access?	-0.108 (0.051)	0.015 (0.066)	-0.083* (-0.030)	-0.011 (-0.004)

Victimization				
In-Person bullying	-0.021 (-0.070)	-0.035 (-0.103)	0.002 (0.008)	-0.012* (-0.036)
Cyber bullying	0.321** (0.323)	0.374** (0.334)	0.351** (0.394)	0.168** (0.174)
Cyber dating violence	0.148* (0.188)	0.420** (0.474)	-0.007 (-0.015)	0.238** (0.408)
Psychological dating violence	-0.086** (-0.209)	-0.142**# (-0.307)	0.001 (0.004)	0.005 (0.017)
Physical dating violence	0.124* (0.185)	0.140** (0.185)	0.067** (0.114)	0.076** (0.120)
Female	0.083 (0.039)	-0.040 (-0.017)	-0.166**# (-0.067)	-0.003 (-0.001)
Race				
Black	-0.053 (-0.011)	0.225 (0.043)	0.024 (0.005)	0.166* (0.031)
White	-0.030 (-0.011)	-0.055 (-0.018)	0.004 (0.003)	0.040 (0.012)
Hispanic	-0.185 (-0.029)	-0.267 (-0.038)	-0.037 (-0.009)	0.055 (0.012)
Expected grades	0.165 (0.100)	0.098 (0.053)	0.046 (0.024)	-0.035 (-0.017)
Anger	0.060** (0.185)	0.049** (0.134)	0.017** (0.052)	0.015** (0.044)
Parental closeness	0.046 (0.043)	0.051 (0.052)	-0.035 (-0.027)	0.025 (0.019)
Parental education	0.048 (0.075)	0.028 (0.039)	0.016 (0.021)	0.001 (0.001)
Constant	-0.544	-0.397	0.066	-0.091
R-square	0.297	0.470	0.228	0.367
Adjusted R-square	0.264	0.445	0.223	0.363

Standardized coefficients in parentheses

** = <.01

* = <.05

= Statistically significant differences across age groups (LR test, imputed data (p<.05)

Table 15

Table 15. Imputed OLS Regression Models for Cyber Perpetration, by Gender

	Boys (N = 2,705)		*Girls (N = 2,904)*	
	Cyber bullying	**Online dating aggression**	**Cyber bullying**	**Online dating aggression**
Computer Activities				
Chat	0.057 (0.039)	0.002 (0.002)	-0.010 (-0.011)	0.008 (0.007)
Email	0.004 (0.002)	0.040 (0.023)	0.011 (0.009)	-0.001 (-0.001)
Blogs/posting online	0.076 (0.038)	0.108** (0.058)	0.028 (0.032)	0.023 (0.019)
Research	-0.070 (-0.040)	-0.071* (-0.044)	-0.077** (-0.069)	-0.115** (-0.077)
Social media	-0.001 (-0.001)	-0.008 (-0.006)	0.030 (0.034)	0.030 (0.026)
Visiting sites w/ user generated content	-0.020 (-0.012)	-0.007 (-0.005)	0.032 (0.025)	0.033 (0.020)
Cell Phone Activities				
Chat applications	-0.017 (-0.017)	-0.053** (-0.058)	0.005 (0.009)	-0.027 (-0.036)
Email	0.079 (0.047)	0.004 (0.003)	0.022 (0.020)	-0.035 (-0.023)
"Other" websites	-0.018 (-0.015)	0.001 (0.001)	0.002 (0.003)	-0.001 (-0.001)
Social media	-0.007 (-0.007)	0.008 (0.009)	-0.008 (-0.013)	0.026 (0.034)
Texting	-0.006 (-0.007)	0.031 (0.037)	-0.002 (-0.003)	0.016 (0.021)
Most Used in Bedroom				
Computer	0.086 (0.028)	-0.052 (-0.019)	-0.050 (-0.027)	0.018 (0.007)
Cell Phone	-0.073 (-0.022)	-0.020 (-0.007)	0.074**# (0.039)	0.102* (0.040)
Most Used Late at Night				
Computer	-0.110 (-0.022)	0.028 (0.006)	-0.082 (-0.023)	-0.076 (-0.016)
Cell Phone	0.102 (0.015)	0.242* (0.039)	-0.070 (-0.017)	-0.044 (-0.008)
Parents restrict website access?	-0.170**# (-0.053)	-0.060 (-0.020)	-0.038 (-0.019)	0.067 (0.025)
Victimization				

In-Person bullying	0.016 (0.042)	-0.011 (-0.032)	-0.008 (-0.035)	-0.009 (-0.027)
Cyber bullying	0.423**# (0.377)	0.256**# (0.246)	0.268**# (0.401)	0.108**# (0.120)
Cyber dating violence	-0.005 (-0.007)	0.279** (0.435)	-0.019 (-0.047)	0.190** (0.345)
Psychological dating violence	0.008 (0.020)	-0.027** (-0.70)	0.007 (0.035)	0.025** (0.089)
Physical dating violence	0.067** (0.101)	0.067** (0.108)	0.038* (0.074)	0.071** (0.102)
Age	0.008 (0.009)	-0.006 (-0.007)	-0.006 (-0.010)	0.043**# (0.055)
Race				
Black	-0.005 (-0.001)	0.028 (0.005)	-0.029 (-0.008)	0.272** (0.052)
White	-0.037 (-0.010)	-0.015 (-0.005)	0.054 (0.024)	0.108 (0.036)
Hispanic	-0.117 (-0.023)	-0.011 (-0.002)	0.009 (0.003)	0.116 (0.028)
Expected grades	-0.077 (-0.036)	0.006 (0.003)	-0.066 (-0.042)	-0.018 (-0.009)
Anger	0.027** (0.067)	0.018** (0.048)	0.015** (0.065)	0.015* (0.047)
Parental closeness	-0.062* (-0.041)	-0.001 (-0.001)	(0.007) (0.007)	0.052* (0.042)
Parental education	0.021 (0.023)	0.010 (0.012)	0.019 (0.035)	0.002 (0.003)
Constant	-0.081	0.060	-0.140	-0.995**
R-square	0.252	0.379	0.202	0.344
Adjusted R-square	0.243	0.372	0.194	0.337

Standardized coefficients in parentheses
** = <.01

* = <.05

= Statistically significant differences across gender groups (LR test, imputed data (p<.05)

Table 16

Table 16. Imputed OLS Regression Models for Cyber Perpetration, by Race

	White (N= 4,416)		*Black (N = 375)*	
	Cyber bullying	**Online dating aggression**	**Cyber bullying**	**Online dating aggression**
Computer Activities				
Chat	0.022 (0.019)	0.004 (0.004)	0.059 (0.044)	-0.014 (-0.008)
Email	0.001 (0.001)	-0.003 (-0.001)	0.239* (0.133)	0.209 (0.096)
Blogs/posting online	0.017 (0.013)	0.010 (0.007)	0.043 (0.026)	0.242* (0.118)
Research	-0.087** (-0.061)	-0.077** (-0.050)	-0.171 (-0.095)	-0.196 (-0.089)
Social media	0.019 (0.016)	0.034 (0.027)	0.033 (0.025)	-0.023 (-0.014)
Visiting sites w/ user generated content	0.017 (0.011)	0.015 (0.009)	-0.185 (-0.098)	0.100 (0.043)
Cell Phone Activities				
Chat applications	0.007 (0.009)	-0.021 (-0.025)	-0.074 (-0.077)	-0.165*# (-0.141)
Email	0.059* (0.041)	-0.003 (-0.002)	-0.130 (-0.084)	-0.180 (-0.096)
"Other" websites	-0.002 (-0.002)	0.008 (0.007)	-0.024 (-0.022)	-0.045 (-0.034)
Social media	-0.011 (-0.015)	0.008 (0.010)	0.051 (0.056)	0.054 (0.049)
Texting	-0.005 (-0.008)	0.012 (0.016)	-0.038 (-0.042)	0.036 (0.032)
Most Used in Bedroom				
Computer	0.002 (0.010)	0.002 (0.001)	-0.132 (-0.038)	-0.338 (-0.079)
Cell Phone	0.016 (0.007)	0.057 (0.021)	0.077 (0.021)	0.153 (0.035)
Most Used Late at Night				
Computer	-0.117 (-0.027)	-0.019 (-0.004)	-0.150 (-0.028)	-0.072 (-0.011)
Cell Phone	-0.023 (-0.004)	0.049 (0.008)	0.001 (0.001)	0.339 (0.050)
Parents restrict website access?	-0.081* (-0.032)	0.019 (0.007)	-0.122 (-0.031)	0.007 (0.002)
Victimization				

In-Person bullying	0.002	-0.013*	0.022	-0.042
	(0.006)	(-0.041)	(0.053)	(-0.082)
Cyber bullying	0.310**	0.185**	0.484**	0.298**
	(0.349)	(0.192)	(0.537)	(0.272)
Cyber dating violence	0.003	0.229**	0.037	0.254**
	(0.005)	(0.398)	(0.066)	(0.374)
Psychological dating violence	-0.007	0.003	-0.036	0.014
	(-0.023)	(0.010)	(-0.096)	(0.031)
Physical dating violence	0.065**	0.081**	0.102**	0.168**
	(0.109)	(0.126)	(0.169)	(0.227)
Female	-0.095**	0.002	-0.157	0.281
	(-0.041)	(0.001)	(-0.046)	(0.068)
Age	0.002	0.022*	0.059	-0.006
	(0.002)	(0.028)	(0.053)	(-0.005)
Expected grades	-0.092**	0.041	-0.203	-0.242*
	(-0.048)	(0.020)	(-0.090)	(-0.088)
Anger	0.022**	0.019**	0.030	0.001
	(0.069)	(0.056)	(0.082)	(0.003)
Parental closeness	0.002	0.043*	-0.010	0.094
	(0.002)	(0.033)	(-0.007)	(0.048)
Parental education	0.021	0.002	0.107	0.089
	(0.028)	(0.002)	(0.106)	(0.073)
Constant	-0.175	-0.465**	-1.542	-1.000
R-square	0.185	0.361	0.535	0.565
Adjusted R-square	0.180	0.357	0.499	0.531

Standardized coefficients in parentheses

** = <.01

* = <.05

= Statistically significant differences across racial groups (LR test, imputed data (p<.05)